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CONTENTS

Designing an Environment for Man. ROGER B. THOMPSON

Part I. Selection and Arrangement of Plants in the Landscape 1

Part II. Qualities of Space 6

Jardin Gillet of the Belgian Congo. LOUIS O. WILLIAMS 12

Poinsettias as Landscape Plants. VIRGINIA W. GAUNT 18

The "Earth Apple." PAUL L. DOUGHTY 21

The Hellebores. A. E. LEUDY 26

Attractive Perennial Campanulas. ROBERT M. SENIOR 32

The Philippine Jadevine. MONA LISA STEINER 42

A Book or Two 46

The Gardeners' Pocketbook

Some Thoughts on Foundation Planting 50

Autumn Foliage Colors on Glenn Dale Azaleas 52

Magnolia grandiflora From Cuttings 53

Summer bloom from bulbs 54

A First Planting of Brodiaeas 55

Thryallis glauca 55

Arum pictum, Oh, No! 55

Echeveria affinis

A new succulent from Sinaloa, Mexico 56

Rosa mutabilis 57

The Native Cross-Vine 57

Firmiana simplex 58

A Note on Early History of *Saintpaulia* 60

Crinum, Ellen Bosanquet 60



Strongylodon macrobotrys

A close-up view of the foliage and pendent inflorescence

(See Page 42, The Philippine Jadevine)

Designing an Environment for Man

ROGER B. THOMPSON*

PART I

Selection and Arrangement of Plants in the Landscape

Man is continuously changing the form and use of vast areas of the earth's surface with the hope of reaping some benefit, but expending only a minute fraction of this labor with the intention of increasing his own pleasure in its appearance. The number of people interested and actively engaged in its visual improvement, however, is very large, particularly in the United States and those other countries where space, money and leisure permit more than token activity.

The effectiveness of this group, the gardeners, is quite generally reduced by a preoccupation with plants. Horticultural perfection does not assure landscape beauty. This was forcibly impressed upon me more than twenty-five years ago when I watched a British landscape architect build, for one of the larger flower shows, one of the most beautiful rock gardens I have ever seen, although the quality of plant material available to him was no better than mediocre.

This is not to suggest that quality of material is in any way inimical to quality of design; it is merely to indicate that

a preoccupation with one (and this applies to either) may lead to some neglect of the other. The ability to use plants in the landscape may be limited by a tendency to view plants as ends in themselves. When a plant is considered to have intrinsic merit, when it has become an end sufficient unto itself, as may any blue ribbon winner, the gardener may have great difficulty in appraising its value in the landscape. He even may be quite disturbed if told it has little to none. Ability to design is to a considerable degree dependent upon ability to abstract, to see a landscape not as made up of a list of plants but rather as an organization of forms, textures, colors.

To the landscape designer, a plant is a material which he uses to produce a desired effect. He makes a relatively objective appraisal of its qualities in much the same way that a building designer appraises his brick and wood and, if it meets with his approval, makes use of it. If, in his estimation, it does not have the qualities required for its position in the design, he is undeterred by any factor of name, rarity, nostalgia, or price. He feels no qualms at disregarding plants that win show prizes in favor of those as common as cabbages, or forgoing the "better" varieties of the specialist as less useful than the old.

This process of selection seems to be something of a mystery to those who have seen their scrubbed and laundered

*Roger B. Thompson, a landscape architect, is Assistant Professor of Horticulture in the University of Tennessee at Knoxville. Under the titled subject, Professor Thompson will discuss the elements of landscape design in four papers. The first two: art structure and principles of organization, and spatial development or the organization of space, are presented now. Indoor and outdoor relationships, and the reconciliation of man, plants, and grounds, will appear in a later issue of the magazine during the year.

specimens passed by. When it is remembered that plants are being selected for their structural and design qualities, exactly as a building designer selects his wood and stone, the question becomes less mysterious.

The noted analogy between plant and structural materials should be more fully explored. In each, strength and durability adequate to the purpose would seem to be prime requisites. To make the application specific: a plant must grow. It must grow well in the climate of the area, in the specific habitat location, without requiring more cultural attention than the owner is both capable and willing to expend. And it must be relatively permanent.

Each climatic area imposes its own restrictions upon choice. Each microclimate and habitat within this larger area present variants which may either enlarge or restrict the list of species and varieties it is feasible to use in any specific location. For example, the climate of the upper south permits the growing of many of the semi-evergreen azaleas. The necessity for special soil preparation in some localities which must contend with calcareous soils, heavy clay or an excessive amount of sand is widely understood, but we still frequently see them planted on the south side of homes in subdivisions which, with respect to this genus, must be considered both barren and arid.

The list of plants suitable for any site, however, is initially extensive. It is only when we apply visual criteria that it begins to so rapidly diminish that we begin to wonder whether any plant can be found to fill the bill or whether some compromise will be forced upon us.

Mature *size*, obviously, becomes a prime consideration. When time to maturity is long it may be coupled with rate of growth, thus introducing a variable to be related to sociological and other factors not primarily concerned with visual appearance. When time to maturity is relatively short and mature size closely predictable, the problem is simplified.

Plants do much more to space than simply occupy it in increasing amounts during the years. They also divide space. While it is obvious that as a tall plant

matures it will increase its occupancy of space from that portion below eye level to that directly at eye level (and at this stage may constitute a complete blockage) and may pass on upward to occupy very largely only space above eye level, the effect of these changes upon the visual appearance of the entire landscaped area is often underestimated. For instance, camellia fanciers who were much pleased with the layout of their plantations when young, when it was possible to look over them without interruption of the view, have sometimes been seized with consternation when their plants grew large enough to block view at eye level, for by then the total space had become fragmented and their view restricted to the small areas between plant and plant. A more extended discussion of space in the landscape, a very complex subject is given in Part II below.

Size in plants must also be considered in relation to their *form* and *density*. Size can usually be restricted by pruning, for even such a normally large tree as the beech may be clipped or sheared to hedge size and thus restricted indefinitely. Such practices necessarily alter form. If natural form is to be completely preserved no major top pruning can be practiced. Root pruning also can restrict size, but inevitably alters form and density, the short terminal growth of a severely root pruned plant increasing the frequency of lateral growths. We may compare *Vitex agnus-castus* and *Buxus sempervirens* as offering some extremes in rate of growth, form and density, although the ultimate heights and widths of some varieties may not be far different.

Density of deciduous plants varies with season, to the degree of completely obscuring view or permitting considerable penetration. As penetration of the plant mass is increased by reduction of foliage, form also changes; outlines become less precisely defined and structural *lines* of trunk, branches and twigs become more evident. Thus, as the aspect changes, attention is moved from one portion of the plant to another or, as the appearance of the plant group changes, it may be diverted from one plant to another, effecting a considerable change in focalization and emphasis. The result may be a very desirable variability in the scene or, when unexpected and unplanned,

may cause a serious disintegration of the composition.

Very great opportunities for diversity are offered by *texture*, a quality often almost unrecognized and frequently handled with apparent but entirely unwarranted trepidation. Several of the older books on landscaping even warn against strong textural contrasts and advocate careful transitions. I have a feeling that these writers merely reflect a narrow experience and are not well acquainted with the drama and vitality which become increasingly evident as one approaches the tropics with its astonishing leaf sizes and juxtapositions.

On the other hand, need for textural diversity and change may not be appreciated simply because this characteristic has passed unnoticed. I have in mind a small woodland composed largely of dogwood and black cherry, with a few persimmon and blackgum, a small elm or two along one border, and hickories in the distance. On remarking to the owner of the near uniformity of leaf size and consequent monotony of effect, he replied that he had never noticed it before, but that the addition of oak, pine and tulip certainly would add to the interest. In such a landscape some very important shrubs, as the lilacs and several of the viburnums, would be undesirable simply because of their size of leaf. Plants with smaller or larger leaves, as crape myrtle, Mentor barberry and oak-leaf hydrangea, to mention only a few possibilities among the deciduous, would add important contrast.

The texture of a plant depends upon many more factors than leaf size and shape. Grouping of leaves has a very great effect, and is quite largely dependent upon branch structure, twig formation, and length of internode, the hickories mentioned above giving a quite different effect from that of many genera by virtue of the open *light* or darkly *shadowed* spaces between leaflets, so different from the serried ranks of the dogwood on the face of their dense twig masses.

Leaf outline, whether lobed, serrate or entire, has its effect, especially at close range. So does the surface, with its possibilities for gloss or pubescence, smoothness or deep venation, convexity or con-

cavity, all of which affect direction and degree of light reflection. Rapid variation of reflected light, as seen from leaves of tulip and the poplars from the time they are half grown, is dependent not only upon their surface but more largely upon length and flexibility of petiole, which permits movement in the slightest breeze, so different from the rigidity of stiff or sessile leaves.

In deciduous plants, texture during the leafless period will be determined by number, form and arrangement of branches and twigs. Since these may have been largely obscured by foliage during the summer, texture may remain of similar character, fine or coarse, or may be completely changed. Catalpa, with large leaves and thick, stiff, widely spaced twigs remains coarse in both summer and winter. Willows remain fine to medium fine at both seasons. But goldenrain, which has a soft and fragile appearance when in full leaf, becomes stiff and coarse when divested of foliage.

Color in deciduous foliage can be seasonally subtle or brilliant during the short period of growth and development, the longer one at completion of the cycle, or in some varieties for the duration of the leaf. The less emphatic colors, such as the yellowish or grayish greens, become more positive when viewed in contrast to those bearing hints of other hues and tones. An apple tree in my yard is seen quite obviously gray against the yellow green of dogwood. Against a silver maple it changes from gray to dark green as the wind ruffles the maple leaves and displays one side or the other. Many startling effects have been achieved with colored foliage, some of which appear to be useful for nothing more than to startle.

Evergreen plants exhibit much less seasonal change, at the most a dulling or brightening of their basic hue. A few, notably some of the junipers and arbovitae, suffer a definite change of hue from green toward red, blue or yellow, never brilliant, but decidedly important in any design.

These diverse characteristics of species, covering a range so wide that in a list of many hundreds it is seldom that on close observation any one will be mistaken for another, are at once a joy and

a tremendous challenge to the landscape designer, forcing him to make an orderly selection by characteristic, forbidding the exercise of personal preference except as it may be included as an additional stricture. As he runs through the list of requirements (*permanence, size, form, density, line, texture, and color*), his list of acceptable plants diminishes, even sometimes to the vanishing point. He is then faced with substitution and compromise, a disturbance inevitably of many planned relationships in addition to the item of immediate consideration. Yet how often in his search (for availability, cost, and expense of transportation always intrude) he is offered a specimen meeting no more than one of his requirements with the glib, "It's a better plant!" For his design it may be completely useless.

The assignment of color to position of least importance may seem strange to those who place a high value upon garden flowers. Both color and texture are surface characteristics of materials, and therefore must rate lower than the structural characteristics, size and form. Color in flowers is of less permanence, and consequently of less importance, than texture of foliage. Even the brightest foliage colors, except green, are never pure or intense, being always muted by the green of chlorophyll.

The quality of any landscape design rests upon the qualities of its materials to the same degree that the pleasing or displeasing appearance of a building is determined by its materials. When structurally sound, even the most common can be arranged in a manner visually and emotionally satisfying. Conversely, rare, expensive and well cultured plants do not assure a pleasing landscape any more than the use of glass and stainless steel and anodized aluminum assure a beautiful building, although they may make a flashy one.

The problems of arrangement, since there is nothing so frightening as the complete freedom of the clean sheet of paper or the bare field, have lead to the formulation of many rules and principles. Rules, like crutches, are useful to give temporary security and instill a feeling of confidence. Retained beyond this point they become a handicap.

Principles indicate direction of procedure, and are far less restrictive to the imagination.

One of the oldest rules was that a unified and stable composition could be assured by creating an axis between some important feature of the house, preferably a door or stair, and some distant terminal feature, then arranging identical materials symmetrically on either side. The perfect balance so achieved tended to be monotonous unless interest was increased by increasing the complexity of forms, texture, colors, as seen in the more pleasing formal gardens.

We are constantly facing this problem of how to maintain *unity* or *coherence* while at the same time to provide ample interest in every design we create. Error in one direction leads us toward dullness and monotony, in the opposite toward chaos. A satisfying course between the two is not always easy to achieve.

Analysis of photographs is an excellent method for acquiring judgment of design, often better than observation of the actual area illustrated. Pictures are limited in extent, and published photographs are selected with considerable care for the qualities they display, which are in consequence easily identified. Nor need the subject be limited to landscape, for rooms offer exactly the same problems and because of their size limit possibilities for complexity. It is much easier to make an analysis of a living room than of a half-acre lot. Furthermore, it is not difficult to discover pictures of interiors which show at least half of the room presented, whereas gardens are often shown only by their most attractive fragments, a landscape, even a garden of any size, requiring such a series of views for its complete presentation that publication space would be excessive.

Analysis should first be directed toward discovering what promotes coherence, this being much more difficult to achieve than its converse. *Balance* should be expected and easily detected, not necessarily the *symmetrical* balance of the Taj Mahal or the knot garden, but usually the *asymmetrical* or *occult*. Balance implies an equilibrium of interests, and the interests can be as diverse as all the complex possibilities of size, form, density, line, texture, and color

permit, which is far beyond my power to compute. Balance of identical objects is static; equilibrium of interest tends to be dynamic, for it is held by opposed tensions, all variable with time and some with so unpredictable and ephemeral a force as a passing breeze.

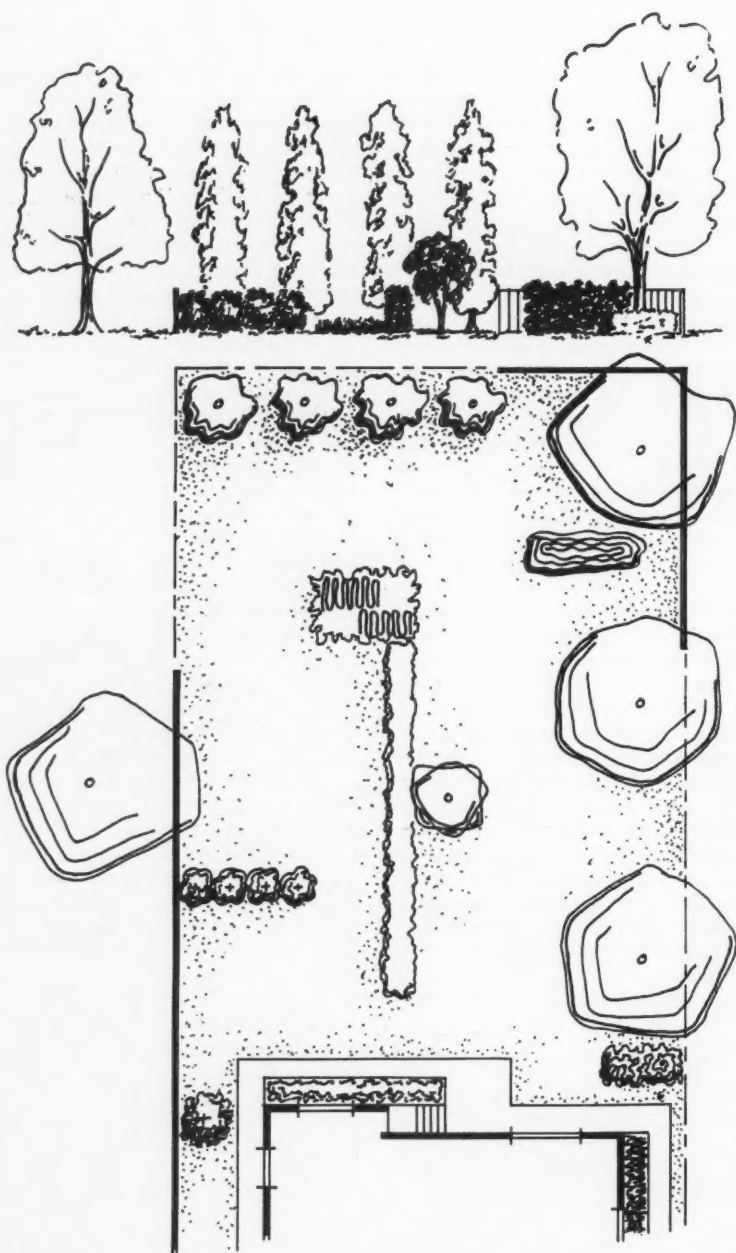
Focalization may be more difficult to detect, for although direction of attention to a determined point by radiating lines, concentric or eccentric circles is sometimes obvious, direction of attention is usually more subtly performed. Focalization may be in a general direction rather than toward a point. No view, however, should have a plurality of focal areas any more than it should have several highly attractive objects, such as "specimen" plants, contesting for dominance, or there will be a scattering of attention and the whole scene will become disorganized by the conflict.

Coherence will be promoted by the clear *dominance* of selected forms, textures and colors and the *subordination* of others, another example of the restriction of attention to particular items or areas. *Repetition* of a single species in the garden is often effective, but when carried to an extreme can become monotonous or, when the repetition follows no clear pattern, can submerge focalization in accumulated detail. Arrangement of place settings around a table creates *rhythm* rather than simple repetition. The individual items are so diverse in size, form, texture and color that interesting minor patterns appear among the dominant pattern of the larger items, usually the dinner plates, which alone would have been simply repetitive. This, incidentally, is an instance of a design field severely restricted by tradition in selection and placement of objects, allowing little latitude except minor changes in form and surface decoration of individual items.

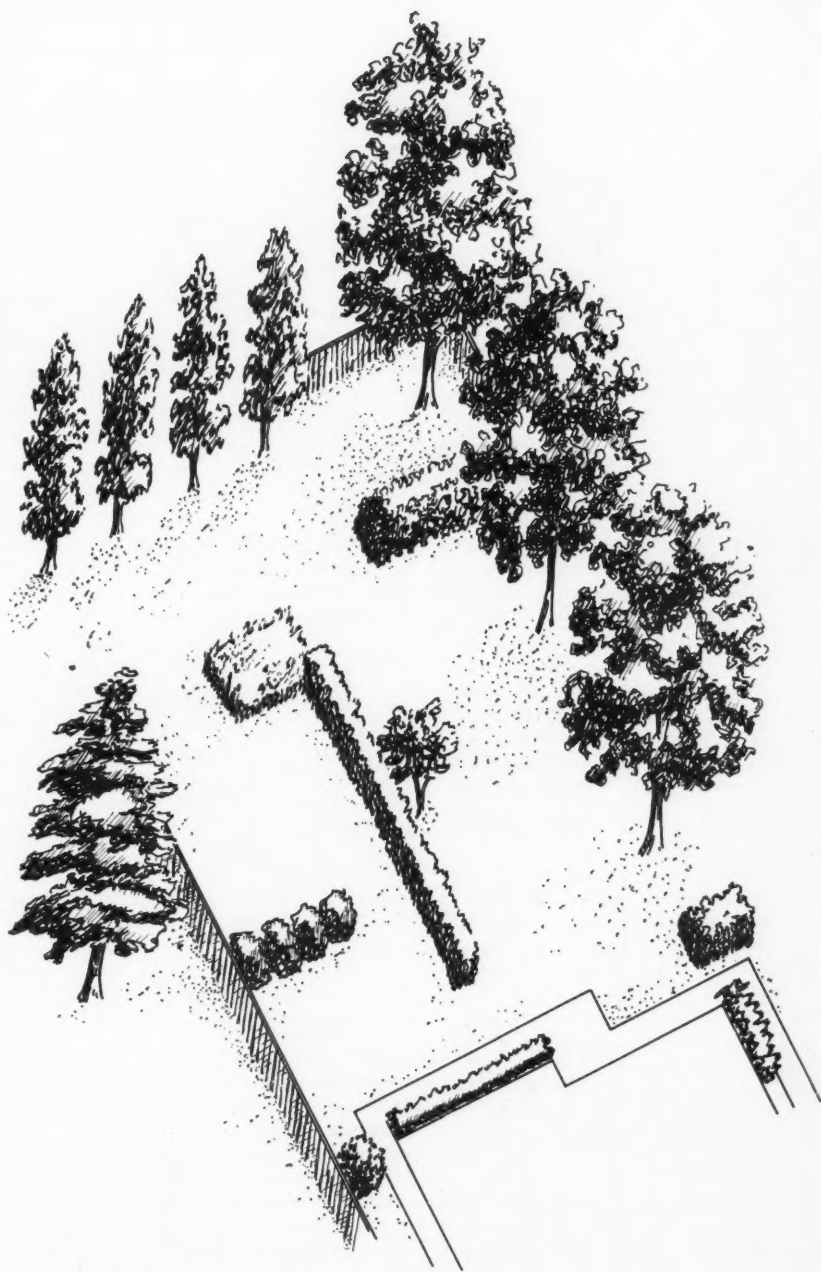
To further explore this example, place settings do offer, almost force, beautiful contrasts of forms, textures and colors and in these contrasts produce a vitality that is only realized in other media with considerable effort. They may well be worth considerable study from the viewpoints of both utility and beauty. After all, design is design (this is not intended as an original observation) and anyone who has learned design in any field so thoroughly that he is no longer restricted by rules can design effectively in any other when he has learned to surmount the hurdles of *scale* and *proportion*.

These two words are frequently used as though they were synonyms, but the lack of distinction has, in the past, lead to serious error. Proportion refers to relationship between parts, whereas scale refers to relationship to a finite measure, such as feet and inches or, especially in landscape and building design, to the size of man. Head height, eye level, seat level, length of stride, all are predictable within rather narrow limits, and must be taken into consideration when designing views, walks and barriers of all sorts. They are of specific application. When designing for children, an entirely different scale must be used.

Proportion, being the relationship between parts and of parts to the whole, plays an important role in every choice, the selection of color or texture of a surface, the choice of size and form of all objects, and of spaces between objects. Effects are determined more by proportions than by absolutes, that is, the size of a leaf is less important to a design than its size in relation to the area it covers and to the other objects and spaces seen in relation to it. In any design, position is restrictive, limiting possibilities, but proportion controls the finer relationships. Often the only difference between a mediocre design and one of outstanding beauty is a matter, but by no means simple, of refinement of proportions.



The lower drawing gives a Plan View of a property in which space is seen to be divided into areas of varying size, each differing from the other in character and degree of enclosure. An Elevation Sketch of the same property as seen from the direction of the house is given in the top drawing, representing only vertical space and mass.



An Isometric Sketch of the same plan showing both horizontal and vertical spatial relationships

(THE THREE DRAWINGS PREPARED BY THE AUTHOR)

Designing an Environment for Man

ROGER B. THOMPSON

PART II

Qualities of Space

The term "space" is subject to many different interpretations determined by the experience and emotional response of the observer. The child sees it first as void, as mere emptiness, as unoccupied area in which he may wave his hands or move about without coming in contact with any object. Later he apprehends it also as distance, and gradually comes to appreciate relationships between himself and objects within his range of vision.

His experiences with distance, however, are never completely visual; they are kinetic as well. Distance between hand and object must be experienced with movement of the hand, a reaching motion. When the object is beyond reach other motions become necessary, either those of the body or those of the object. And with distance comes delay. Thus do we obtain our initial spatial experiences and begin to gain understanding of the qualities of space that are of most use to us, its void, its distance, and its relationships to movement, energy, and time.

Space in the landscape, as void, elicits intellectual and emotional responses varying with the individual. One may see it as space to be filled, that requires some degree of filling to become of value, as did the draftee from an eastern state who was unceremoniously, or with only the minimum standard military ceremonies, transferred to a camp on the plains. After gazing out of his barracks

window the first morning, after a night arrival, he quickly returned to his cot, replying to his bunkmate's query, "This is the sort of place where it don't take more'n a minute to do a couple of days looking."

Contrarily, the plainsman may be inclined to consider many of the usual landscape components mere clutter in his delightful void. Some years ago one of my students who was having an unusual amount of difficulty with his landscape design problems asked, "Well, why do people want trees around their houses, anyway?" I never understood his frustrations until I came to know his home, a ranch with view of the earth's rim on all sides almost unmarred by any growing thing save mesquite trees no more than a dozen feet tall a mile distant.

On a more familiar scale, we see these responses determine the character we expect of our intimate surroundings, one person of extreme taste only happy when his garden shows not one square foot of "wasted" space between wall and wall, another content with the blankness of an open, even-textured lawn. Unfortunately, the printed word has been used to promote the idea that each is the most desirable refinement of landscape design, and that both are necessary for perfect enjoyment, nor is it difficult to discover examples produced by these divergent views, each of which may have been designed by an "authority." But space

completely occupied and space remaining void offer only the most crude spatial experiences; refinements come with the intrusion of elements which define and direct space, both horizontally and vertically, and so give it appreciable size and form.

We see space as distance by means of our binocular vision, and through the clues of diminution of size, of aerial and linear perspective. When one item lies farther away than another of identical size it appears smaller. Since we have grown accustomed to assuming "normal" sizes for familiar objects, we have also come to judge distance through their identification. When we see a man approaching we may judge his distance from us by his size, but if his size is much less or greater than what we have learned as normal, and no other standards are in view, we may greatly misjudge his distance.

We have also learned that the apparent convergence, either horizontally or vertically, of known parallel lines indicates distance. This has suggested the possibility of tricking the eye into perceiving a greater distance than the actual by the designed convergence of lines in objects, as of hedges or pathways, our experience has told us are usually parallel. The trickery becomes immediately obvious if a human being or any object of known human scale is allowed to enter into the composition, and usually is apparent because of the lack of aerial perspective, which would have caused a reduction of sharp contrasts and distinctions and a slight graying or bluing of the atmosphere with distance.

Although the faking of aerial perspective has also been attempted, by the progressive planting of plants with more and more dull or grayish foliage, there are few instances where the designer has sufficient control of the view to make the deception complete and convincing.

Yet the appreciation of distance also depends upon movement and remembered movement, inextricably associated with expenditure of energy, and consciousness of one's position in space. Thirty steps are a long way to a child in his first adventuring, when any relinquishing of a clasped hand projects him into an alien and perilous country.

And thirty steps may be a distance too far for traverse to the elderly; the end of even a small garden hopelessly distant.

How large, then, should any space be? What is the standard length of a basketball court? That depends. For college play it is eighty-four feet, for high school it is seventy-five, and for the elementary school sixty. What should be the size of a lawn or a house lot? That will depend on the number and ages of the people and upon their activities, though in spite of the best intentions they always seem to be a little too small for the occupants, a little too large for the maintenance man. How large should a garden be? This may have to be regulated by the energy and available time of one devoted person.

When energy is without predictable limit or is easily and cheaply purchased in either flesh or high grade gasoline and steel, energy in relation to distance may be but dimly perceived; time becomes the important measure. Once four miles was to many of us a brisk hour's walk; now it may be four minutes on the super-highway and ten cents worth of refined fuel. Yet in terms of landscape the two are not truly comparable for the rapidly changing point of view of the rider, even when his position is that of noncombatant so he may give his full attention to the scene, permits him to catch only the large and obvious spatial relationships, seeing little of those objects which rely for their effectiveness on the qualities of intricate form, texture and color. Spatial values tend to increase in importance with increase in the distance/time relationship.

But space has other qualities than area, distance, time; it has form as well, three-dimensional form, defined by the masses of all objects, as trees and buildings, which intrude into space. Forms of mass and space are complementary, one positive, the other negative. They bear the relationships of figure to background, of matrix to cast, of ball to the cupped hand. We see these relationships most clearly when the forms of mass are presented in simple, geometrical solids, bounded by smooth planes and precise edges, as in simple, cubical or rectilinear buildings.

The clearest display of spatial form is

found in cities where rows of very tall buildings, clean in outline, even severe, not encumbered or "softened" by ornament which (as the designer intended) diverts the eye and prevents full appreciation of their simple, basic, boxlike rectangularity. A series of city blocks of this sort, when seen from a point of vantage, may appear as though stamped by some gigantic die which had pressed the streets deep into the earth so they have become canyons through which we walk, feeling that the surface must be far above us, where the sun shines.

In these shadowed chasms the buildings tend to lose their importance and exist only as walls defining the narrow space between them, which turns or branches, widens to a public square or diminishes with distance, but is everywhere the most important form to be seen.

In formal gardens spatial form becomes clearly evident where height of hedges approaches that of the observer's eye and distance between them is relatively short. Here again we get the feeling that a die has been pressed down, leaving an impression, this time in what we may imagine to have been a solid mass of foliage. As the scene widens in proportion to height the feeling of three-dimensional space decreases. Where the expanse is broad and the height relatively low it may be lost entirely, the plantings being seen as ground pattern only or in low relief, as decorative markings are stamped upon a pat of butter.

Thus it is seen that height, vertical distance, is of the utmost importance in comprehending three-dimensional space, and the greater the height the greater the possibilities for making valuable three-dimensional arrangements of space. At the top of the tallest object in view, the tallest tree or tallest building, our design terminates. Having no further objects for comparison, no points of reference in the void of the sky, all the thousands of feet or even miles between treetop and cloud have little meaning. It is only in the space between tree top and ground that we may create our design—and the lower the tree the less space we have to work with, the less our freedom of action.

It has been written (and I have seen it

in several places) that the single-story house so frequently built today demands small trees only in the landscape. But the landscape is exactly as broad as ever, our need for height and our personal responses to height exactly the same as when we built great houses and surrounded them with trees that reached a hundred feet at maturity. Although not every property may be suitable for even one tall tree, where subdivision has reduced lot size to a minimum, when we fail to establish these landmarks in the sky over any large area we thereby diminish our experiences of space as void, as distance, as form, which are some of our truly exhilarating experiences of nature.

The reason for advocacy of small trees instead of large for low houses rests upon the ideas that a landscape must end at a property line and that there is some intrinsic aesthetic relationship between house and tree. It has been said that if a fifty to sixty foot tree is in good proportion to a two-story building, a twenty-five to thirty foot one must enjoy the same relationship to a house of a single story. I have not heard anyone attempt to project this relationship in the opposite direction, for with the four-story building the tree would immediately soar to absurdity and the height of any building would be seen as an obviously spurious reference mark for a landscape design. Man's works have changed, but the size of man, the only stable measure of man's relationships to his surroundings, has remained constant. An understanding of three-dimensional space and the true extent of the landscape, which lies around us in all directions to the limits of our view, seems important if we are to produce the maximum of human enjoyment.

We are so accustomed to planning gardens on the plane of the earth's surface, or of the draftman's paper, and executing them with trees, shrubs and other objects thrust upward into space, that most of our attention has quite naturally been given to the objects. Often these are selected or designed for the purpose of attracting attention to themselves by means of emphatic form, color either continuous or seasonal, or strong textural character.

Objects are frequently placed in positions where they intrude upon the attention without consideration for the effect on space; witness the blue spruce or weeping willow in the otherwise open lawn. The regular, or even fantastically irregular flower bed in a similar position, in spite of its slight elevation, may attract so much attention as to seriously affect three-dimensional space.

Perhaps we have been told too frequently that the landscape is a picture, or series of pictures to be viewed from many positions. Unless one is forced to view it from a window or other fixed position and never enter into it, it has very little resemblance to and holds none of the experiences of the picture, which is merely a vertical plane surface on which someone has attempted to create the illusion of three-dimensional space. Pictures deal with illusion; landscape with reality. And one criterion of reality is personal involvement and participation. In this respect the landscape is closely akin to architecture and sculpture. Participation is not merely intellectual and emotional; it is physical as well. The three produce their effects by similar methods, are subject to similar criteria and provoke experiences of a similar order.

It is not enough that we should look at a building, no matter how beautiful, for it is more than an organization of walls and columns. It is an organization of space. In order to gain experience of its reality, of its relation to human beings, we must pass through its doorways, its corridors and rooms, gaining a kinetic as well as a visual experience. With sculpture it is not enough to see, we must touch, not with the finger tips for these nerve ends transmit the qualities of surfaces, but with the cupped palms around its convex forms, the hand exploring its deeper shadows, and the whole arm enveloping its mass. So with the landscape, we obtain fullest experiences of its qualities by passage through its spaces as both horizontally and vertically defined.

The landscape which provides us with the richest experiences is the one that contains interesting forms, lines, textures, colors and also provides us, on whatever scale we may be operating, with varied

and provocative spatial experiences; wide, narrow, low, high, dramatically converging, or suddenly opening wide to climax our exploration. These are the experiences we discover in the diverse natural landscape in ravine and trace, thicket and high, open woodland, field and hilltop, with their multiple adventures of freedom and restraint, excitement and quietude.

As experiences with spatial form increase in number and complexity we gradually become aware that space is without limit, that it may be formed and directed but never brought to an end. The legal boundary line or even the high garden wall is no longer a finite ending, for though we may blockade the view space escapes upwards, overleaps all hurdles, and remains continuous with space on all sides, everywhere. The forming and direction of space, its restriction and expansion, diversion and modulation, give a distinct feeling of flexibility and also of directional movement, a distinct sense of flow; certain spatial situations seeming to hurry us along as in a swift stream, others to check our progress or shunt us aside into a pool of quietness.

The first step in our orientation toward space instead of things may well be a reconsideration of the definition of landscape design. Too often it has been presented in popular works as the selection and arrangement of objects in outdoor space. This places emphasis on objects: trees, shrubs, flower beds, bird baths, and so forth. When we consider landscape design to be the organization and development of outdoor space for human use we place emphasis upon the area within which man moves and by implication upon man himself, the most important constituent of the landscape.

With focus on man, his experiences in space and with the objects used for its development, the landscape comes into view as a large segment of the environment of man. We now find ourselves in a position to explore man's reactions to this environment, to improve our understanding of the nature of his experiences, the character of landscapes which produce desirable experiences, and the methods by which such landscapes may be achieved.



*An Angraecum orchid growing spontaneously on a tree
in the Jardin Gillet.*

*Orchids are not abundant in the African tropics and the species the
author saw were mostly less attractive than those seen in the American
tropics.*

Jardin Gillet of the Belgian Congo

LOUIS O. WILLIAMS*

The year 1893 saw the successful termination of the campaign of the Belgians to expel the Arab slavers from the Congo. In that year Brother Justin Gillet began to build up his Jardin d'Essais at the Jesuit Mission at Kisantu in the lower Congo. In 1899, only a few years later, he received funds from the then Independent State of the Congo to begin the development of an experimental garden at the Kisantu Mission. This modest beginning about sixty years ago marked the genesis of what is today one of the most interesting botanic gardens in the Tropics.

The garden, now known officially as "Jardin Gillet" to render honor to Brother Gillet for his years of devoted labor, was intended for the introduction of useful plants of Africa and of other tropical lands. The word useful was taken in its broadest sense. Plants which might be useful in agriculture, horticulture, or forestry were introduced, tried out, studied, and observed.

Plants from all over the tropical world were brought in for study. The Congo region itself was not neglected, however, for most useful plants of the region were brought in and grown for study and observation. Timber trees, which should assume greater importance as the natural supply of workable timber diminishes, were and still are being brought in and grown for observation.

Palms, long used by the Congolese peoples for oil and fiber, were brought together at Kisantu. *Raphia laurenti*, a gigantic raffia palm with leaves thirty to forty feet long may be mentioned among these. This palm produces fiber from its leaves and oil from the mesocarp surrounding the seed. It has been used also by the Congolese people in construction of houses. Palms have always been used abundantly by tropical peoples in primitive stages of culture. *Elaeis guineensis*, the African oil palm, is perhaps the most important African palm. It is now cultivated around the tropical world; several thousands of acres are planted in tropical America, where it is becoming a crop of primary importance.

Specimen-sized trees of most of the important food-producing trees of the Tropics of the world are to be found in Jardin Gillet. A walk about the garden will take one into the Tropics of Asia, the Americas and Africa. *Bertholletia excelsa*, the Brazil nut tree, a forest giant from the Amazon region, grows and fruits very well here. *Hymenaea courbaril*, beloved tree of the Nicaraguans from which they derive their national nickname, *Piñoleros*, grows very well; and there were indications under the trees that the Congolese have learned to use the fruit. Breadfruits of "Bounty" fame, and many other exotic and native trees are to be found.

An orchard of mangosteens, considered to be the "Queen of Fruits" by many connoisseurs, planted sixty years ago by

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A view in Jardin Gillet showing several kinds of plants. The tall tree-like plants with broad leaves are the Traveler's Tree, a member of the banana family. Father H. Callens makes the inspection.

*A view of one of the ponds in Jardin Gillet. Many kinds of
aquatics are growing in this one.*





*A portion of the Jardin Gillet contains plants which may have industrial applications. *Sansevieria cylindrica* (?), illustrated here, is a potential fiber crop.*

One of the houses where aroids of various kinds are grown. Slat houses are excellent for growing aroids in climate of Kisantu.





Cycas circinalis

A fine fruiting specimen in the Jardin Gillet

(ALL PHOTOGRAPHS FURNISHED BY THE AUTHOR)

Brother Gillet, was beginning to produce ripe fruits when I visited the garden in February of 1958. A few fruits were still available when I visited it again in May. Fruits from this fine old orchard sold in the market in Léopoldville help to support the garden.

The Traveler's Tree (*Ravenala madagascariensis*), called "Traveler's Palm" by some, is the plant which spells out "tropics" to me. It is a member of the banana family and is used as an ornamental. The gamut, in size of ornamentals at the garden, is from the monumental Traveler's Tree to one of the smallest orchids from the surrounding Congo forest, a tiny *Bulbophyllum* with flowers hardly an eighth of an inch long. There are literally hundreds of other species used in many tastefully designed settings. Pools contain many species of aquatics from different parts of the world. A cactus-like *Euphorbia* from Africa in a setting with a beautifully flowered specimen of frangipani from the dry hot canyons of Central America seems to be most appropriate.

Cycads have always held a fascination for me. In Brother Gillet's garden there are many fine specimen plants of America, Asiatic and African cycads. Perhaps the finest cycads in the garden are a group of *Encephalartos laurentianus* planted by Brother Gillet when the garden was being started. These cycads are worth a trip to Kisantu.

The collection of conifers is a fine one and brings together genera from many parts of the world. An *Araucaria* from Australia forms a beautiful avenue in the garden. Although the plant grows well it does not produce fruits in this location. *Agathis*, from which damar comes, *Cryptomeria*, *Podocarpus*, *Taxodium*, *Cupressus*, *Libocedrus*, *Pinus* and other conifers may be seen in the garden.

Brother Gillet was obviously interested in palms, both from the utilitarian and aesthetic standpoints and Kisantu is an excellent region in which to grow them. Father Callens, who ably carries on the work initiated by Brother Gillet, has a special interest in palms and would be happy to receive seed from any part of the world to augment the collection. A catalogue of the plants of the garden, published thirty-two years ago, records

almost a hundred species in forty-two genera that were then in the collection. There are many more now.

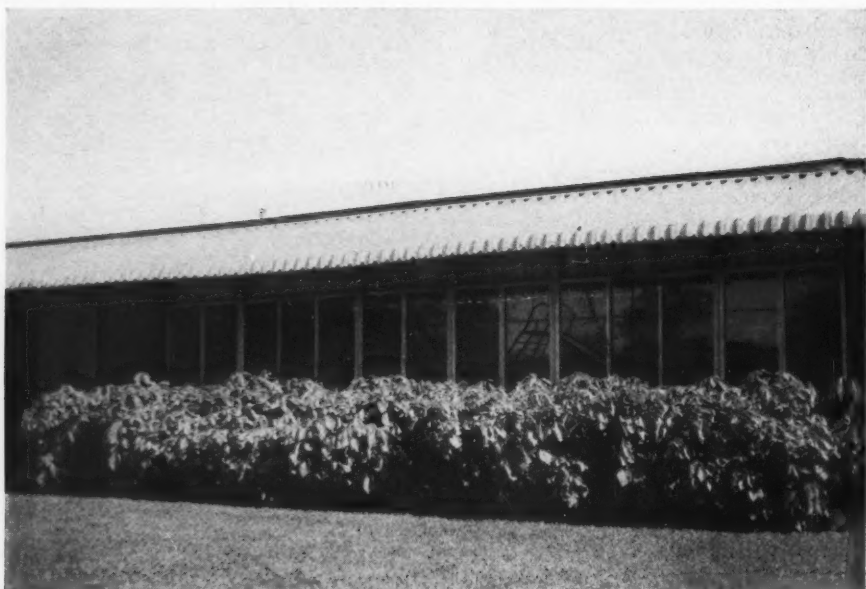
A growing collection of plants of medical or pharmaceutical interest is found at the garden. The collection was begun by Brother Gillet but has been increased rapidly in recent years by Father Callens, the present director. The collection has become famous among the pharmaceutical firms as a result of Father Callens' coöperation with those interested. Father Callens, who has been in the Congo for thirteen years, is not only well acquainted with the thousands of plants in the garden but also with the flora of the region.

Rauwolfia, source of one of the "wonder drugs," grows well in the Congo; and one species, *Rauwolfia vomitoria*, is now being grown in some quantity for exportation. This work is due to the initiative of Father Callens, but the actual cultivation of *Rauwolfia* is carried on by a coöperative of Africans. The coöperative receives some management help from the Fathers at the mission, but it gets all returns from the project.

A school to train Congolese boys in horticulture was founded by Father Callens in 1953. The garden serves admirably as a training area for the boys' practical work. The gardens, plant houses and propagating areas attest the quality of the training. At present there are about eighty boys in the school. The staff consists of Father Callens, two European and two African assistants.

The grounds of the garden, two or three hundred acres, consist of both flat land and low rolling hills. A laboratory building, an excellent class building, a staff house, a guest house, two houses for employees, a dormitory and dining hall for the students, plus many exposition houses for showing the collection, are appropriately located on the grounds. The newest building was a house to shelter the collection of succulents.

Father Callens enjoys having overseas visitors come to the garden. If you have the good fortune to visit the Congo and go to Kisantu be sure to see Father Callens. Kisantu is eighty miles from Léopoldville through interesting countryside and past several African villages. The road should be surfaced all the way in 1959.



A beautiful view is offered, especially during the flowering season, from the glass-enclosed porch as well as from the yard by this free standing bank of double red poinsettias pruned alike on both sides. Planting, hiding the playground equipment from the porch view, is protected from a frost threat by a tarpaulin attached to the metal awning and to stakes in the yard.

Poinsettias as Landscape Plants

VIRGINIA W. GAUNT*

The "foolish little weed-leaves" which, according to the legend, the little Mexican boy laid on the altar as his gift to the Christ child, continue to be a miracle plant in the South Texas landscape. The deep, emerald green leaves and the shining, scarlet bracts offer great beauty.

The shape and texture of the leaf make the plant attractive from the very first showing of green on a twelve-inch cutting. As the plants grow and are pruned, they become more compact, the leaves larger. Banked poinsettias early in the summer, before there is any suggestion of color, are exceptionally ornamental.

The poinsettia lends itself to use with other plants. Combined with juniper, the difference in texture is unusual and in-

teresting. A corner planting of red poinsettias with low-growing juniper is effective in all stages of growth from the first small leaves to the final glory of a four or five foot plant with large emerald leaves and flaming red bracts.

It must be kept in mind that the poinsettia is a large plant, even with regular pruning. The plants should not be used in front of windows or where they will conceal the architectural design of a building. Because of their size, however, they may be used successfully to complement the architectural design.

The prevailing southeast wind in South Texas must be taken into consideration in placing poinsettia plants in the landscape plan. The constant pres-

sure of that wind will cause the plants to be misshapen and since every break causes the plants to "bleed," the lovely bracts may be damaged.

Plants on the north side of buildings do well for several reasons. They are protected from the wind, and in the case of pink and white varieties, the color is more constant than when plants are exposed to the sun. The disadvantage to north plantings is the threat of freeze.

The ideal situation is an eastern or southern exposure protected by a wind-break. This might be the angle of the house, the planting of trees or shrubs, or a garden wall. It is best to avoid a western exposure because the hot summer sun in South Texas is not conducive to the development of the bracts.

Care should be taken to protect the plant from artificial light. During the development of the bloom, the plant requires short days and long nights. A street light shining for long hours on a plant will impair the development of the bloom. Once in full bloom, they are effective under spotlight for evening lawn parties.

There are several shades of red and several shades of pink poinsettias, and even the so-called white variety shows varying degrees from cream to palest yellow. Care must be taken in combining the poinsettia with other blooming plants or color inharmony will result.

Poinsettias are effective in group plantings. Carefully pruned, with the back row of plants left highest and the front row pruned very low, and with the plants staggered so that no plant is directly in front of another, the resulting bank of poinsettias is breath-takingly beautiful. The average bloom is twelve-inches across, and for most effective banking, a difference of ten to twelve inches in the height of the rows will result in a solid mass of bloom.

A "free standing" bank of poinsettias, pruned alike on both sides, forms a beautiful screen to divide the grounds into small gardens.

An interesting effect is gained by planting a group of red poinsettias, then a group of pink, then white, pruning all alike. Care should be taken to plant enough of each variety that the end re-

A bay planting of "apple-blossom-pink oleander," single pink poinsettias and purple "wandering jew" make an analogous color harmony. Across the grass path to the gate is a 'Shirley Temple' Hibiscus (single pink). The difference in textures makes a pleasing

picture all summer. The oleanders and the wood fence protect the poinsettias from the prevailing southeast wind and offer some protection from the summer sun. The house protects the plants from the west sun.



sult will not be spotty. Plants with the same growing habits should be used. Eventually the pink plants will revert to red, but until they do, the effect is beautiful.

A bay planting of tall cherry laurel, oleander or ligustrum as a background for poinsettias is an effective and showy screen for a service area. The tall planting will protect the poinsettias from wind and sun, and the poinsettias will add color to the tall plantings. A reverse plan using poinsettias as the tall background plant for low growing plumbago, pentas or carissa is also effective.

There are many advantages to using poinsettias in the South Texas landscape design. Cuttings started in the spring will produce blooms by Christmas, sometimes by Thanksgiving. They are easily grown and require little care. Rich soil, good drainage to prevent root rot, plenty of water, the use of organic material and commercial acidifying fertilizer, and care and thought in pruning to obtain the desired effect, result in a most rewarding experience.

It is suggested that poinsettias be planted in several locations. One bed might develop root rot, another might not be sufficiently protected from wind, or another might be used by the neighbors children to build castles.

The adverse weather conditions experienced last winter brought out many factors in connection with the placement of beds of poinsettias. It was found that plants protected by trees or by roof overhang survived the killing frost. Plants near a heated wall were saved. Covering plants with tarpaulin or plastic sheet and heated with electric light bulbs or candles, saved many poinsettias.

One of the most important factors in preparing for the possibility of frost is to omit nitrogen in fertilizer used after August. The bracts are larger when nitrogen is used, but the growth is soft and susceptible to freezing. Phosphorus should be used to give strong, sturdy stems.

There are a number of varieties of poinsettias which thrive in South Texas but it is difficult to identify them for

several reasons. Plants may be purchased as St. Louis, for instance, and will hold true to variety for two or three years when, because of weather conditions, atmospheric or soil conditions, the color and size will change, and sometimes the shape of the bract will change.

This has caused a great deal of difficulty in judging poinsettia specimens in horticultural exhibits. The exhibitor has bought a named variety, but over the years its characteristics have changed and it may more nearly resemble another variety. The American Poinsettia Society has approved a scale of points for judging poinsettias, and the Society is endeavoring to establish the identities of the different varieties.

The Henriette Ecke, a double red variety grows well in South Texas. The St. Louis and Hollywood, single reds, are popular. The Ecke White is cream-colored when grown outdoors and the Ecke Pink will range in shades of pink according to soil conditions.

Paul Ecke, a recognized authority on the growing of poinsettias, wrote a South Texas nurseryman: "In your warm climate the flowers on the poinsettias become much larger than they do in this area (Encinitas, California), and the shade of the color becomes entirely different with the additional warmth."

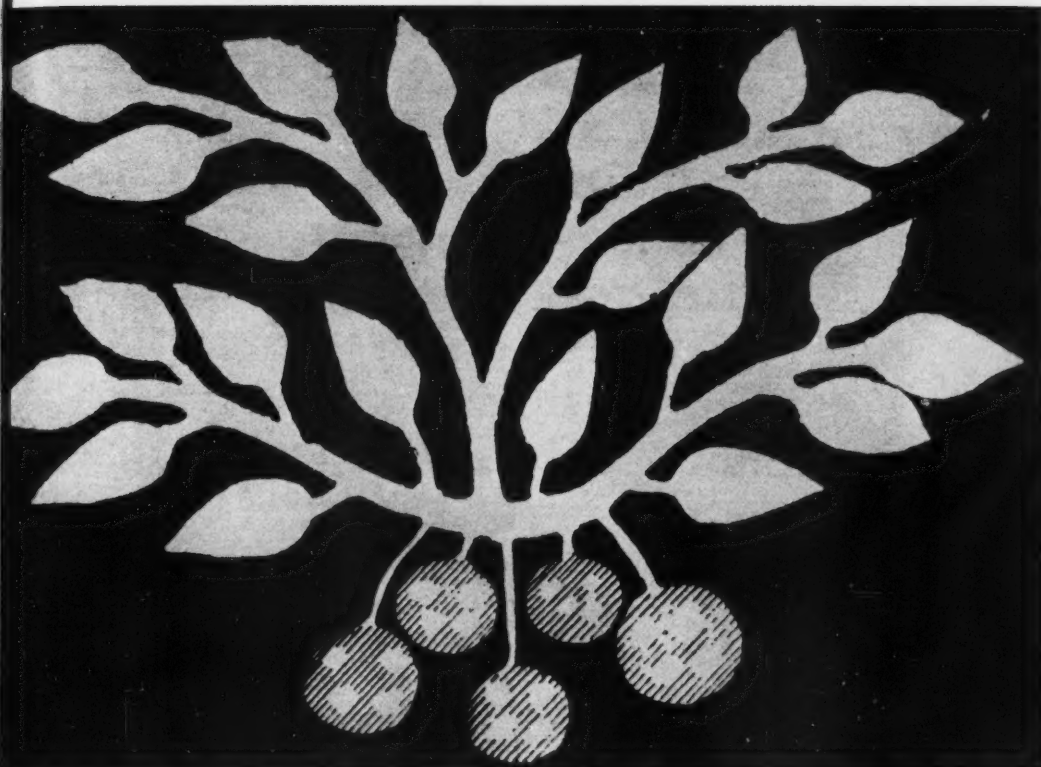
Whatever the variety, the poinsettia is a glamorous and exotic addition to the landscape design. It adds a quality to an all-green foliage planting that no other blossoming plant can give. The variety of shades enables a choice of color scheme.

"The seed that swelled in the ground and grew into a tall green weed, became, by God's will, a scarlet flower," according to the legend, and it continues to brighten the landscape of South Texas.

*Permanent Executive Secretary of the American Poinsettia Society of Mission, Texas.

The American Poinsettia Society is a newcomer among plant societies. Membership is open to any person interested in Poinsettias. Those interested should write Mrs. Gaunt, Box 94, Mission, Texas.

Volume I, Number I, of the Bulletin of the Society is available to members only. It contains general data on poinsettia culture, potting data, foliage to be used with poinsettias in flower arrangements, scale of points for judging single specimens, constitution and by-laws, and other information.



An aboriginal painting of the potato taken from pottery (Tiahuanacan culture) found in the Nasca Valley of Peru.

The "Earth Apple"

PAUL L. DOUGHTY*

Would you regard the potato as a "rare and delicate" plant or "unfit" for human consumption? It once was. The common potato which we take for granted was adopted in Europe to prevent starvation yet its misuse produced a famine which virtually destroyed a country.

*Paul L. Doughty is a graduate student at Cornell University. This article is a by-product of some of his studies in his major field of anthropology.

Among the many discoveries of the Spaniards in Peru and Chile was the potato. It was a staple food of the Indians and they had developed a multitude of varieties. The Incas and their predecessors probably made it the world's first dehydrated and frozen vegetable.

In the demanding environment of the two mile high *altiplano* or grassy Andean plateau, several special varieties of potato had evolved. These potatoes,



W. H. HODGE

"Dried" potatoes from highland Peru in the form of chuño, an early-day process of dehydrating and freezing the vegetables for safe storage.



John Gerarde (1545-1607)

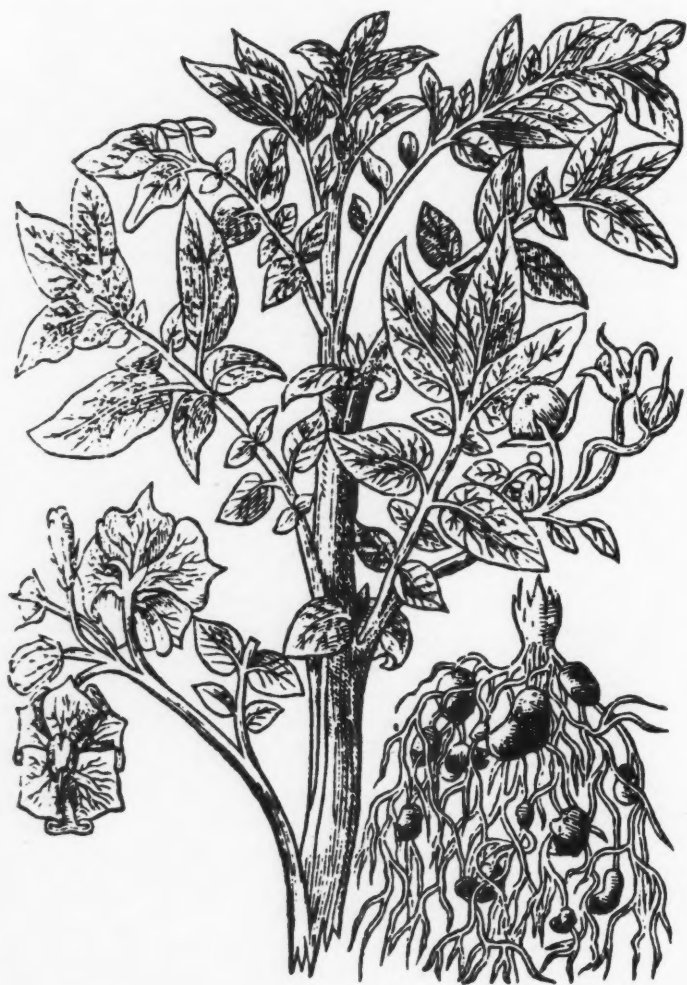
The well-known botanist and herbalist of his day, proudly holding a flowering branch of the white potato, recently imported from the New World.

(FRONTISPICE FROM A LATER EDITION OF THE GREAT HERBALL)

possessing frost resistant qualities, were prepared and preserved by allowing them to freeze during the night and thaw in the daytime, the moisture being pressed from them as they thawed. The final product, called *chuño*, is still made by the Andean Indians as a primary means of storing their potato crop.

The conquistadors quickly perceived the qualities and potentialities of potatoes. One chronicler described it as a "dainty dish, even for a Spaniard." Entrepreneurs made fortunes by selling *chuño* to the Indians who were forced to labor in the mines. Before long, potatoes became standard food on the galleons bound for Spain.

The exact date of their importation into Spain is uncertain. It was, however, sometime before 1570. One would think that such a plant would have found immediate acceptance. This was not the case. Peasants noted its similarity to the Deadly Nightshade, *Solanum nigrum*, so they were suspicious of it. Due to the consequent unpopularity, diffusion of the potato went unnoticed by most scholars. The great Italian botanist, Clusius [1526-1609], observed, however, the use of the potato by Italian farmers, but he did not know its origin. His interest in the potato gave impetus to its introduction into France and Germany when he traveled to those countries.



The first published sketch of the potato appeared in Gerarde's The Great Herbal (1597) under the misleading name of Batata virginiana.

Just when the potato was brought to the British Isles can only be conjectured. The adventurers Drake and Raleigh are credited with having introduced it from the Indies. Proof to support the case of either is lacking, however. By 1589, potatoes were grown as exotic curiosities

in the private gardens of the nobility.

In 1613 potatoes were carried from England to Bermuda and in 1621 taken to Raleigh's Virginia colony. For the first time potatoes were grown in what is now the United States! One of the basic reasons for this paradox, we may sur-

mise, is that the potato is best adapted to the temperate zone and its tubers, used as "seed," cannot be kept for any length of time under hot conditions. Thus, in contrast to the sweet-potato, a tropical zone crop, its diffusion from highland South America across certain of the tropical lowlands of Central America was quite unlikely in pre-Columbian times.

Potatoes did not come into common use for almost a century after their introduction into England. In 1619, James I ate them as a delicacy. Yet, in 1687, many persons thought they best served as food for swine. A paper delivered at the Royal Society in 1662 urged their use for checking famines. Even the Church became involved. Clergymen said potatoes were grown by a "dangerous race" [Indians], and because potatoes were not mentioned in the Bible, they were not proper food.

In France and Germany the situation was similar. Despite the fact that Frederick the Great enforced their cultivation by the use of troops, acceptance was scattered. During the Seven Years' War, a Frenchman named Parmentier learned to like potatoes while imprisoned by the Germans. Because of this, he later experimented with the plant. During the 1770 famine his suggestion that potatoes be used for relief and "prevention" won a prize. General acceptance followed. Parmentier so impressed the King and Queen that the latter is said to have worn potato blossoms in her hair.

The German botanist, Gaspar Bauhin [1560-1624], gave the potato its scientific name, *Solanum tuberosum*, in 1596. But with its multifarious history, the potato became known by a vast number of aliases. It has been called an "earth apple" [Holland, France, and Finland], "earth eggplant" [Tibet], "ground fungus" [Germany], and "potato of Virginia" [England]. The pseudonym "spud" comes from a Scottish word for the spade used in its cultivation.

General use of the potato in Europe coincides with the great rise of industrialism. Reasons for this seem clear: the potato not only produced a great quantity of food per acre, but it could be stored as well. As a result, it became the most important single food in the diet of northern Europeans. Russia,

Germany, Poland, and France, in that order, are the leading producers of potatoes today.

In this process, many areas developed a dangerous monoculture which inhibited adaption to change and disaster. Ireland was such a region. The potato became as important to the Irish well-being as St. Patrick was to their spiritual life. To millions of persons in Europe and America, the Peruvian potato was (and still is) the "Irish potato."

With the monotonous diet, many anemias developed among the Irish. By 1840, potato cultivation had reached its zenith. In the following decade, however, a combination of factors facilitated the spread of a fungus blight which destroyed the crops. Over a million persons died of starvation and the resultant diseases. It is estimated that a hundred thousand persons a year left Ireland for a period of at least ten years. Most came to the United States, the vanguard of the great immigration which built America's industry. Prior to the famine, Ireland's population was almost nine million; today, with a steady decline since 1846, it is less than three.

The "passive" potato has many uses beyond those to which it was put originally. The early Indian civilizations of Peru, aside from growing many varieties of potato and making *chuño*, fashioned unique pottery in its shape. Potatoes were buried with the dead for their food in the after-world.

As a nutrient for men and animals the potato is of prime importance in the modern world. In addition, it has been converted into fuel and reduced to flour and starch. With further modification it becomes "ready-mix" pie fillings, adhesives, alcohol, and a base for ink and paint. As a subject in art, Van Gogh has depicted *The Potato Eaters* and potatoes in *Still Life*.

From such an inconspicuous beginning in Europe no one could have predicted the effect which the immigrant potato has made on the western world. It has been said that the Spaniards took a hundred and twenty-three billion dollars in gold from her New World colonies in the first century after conquest. Yet, with the passage of each seven years, the value of the world's potato crop exceeds that staggering sum.



Helleborus orientalis—the Lenten Rose. Color in the flower comes from striping and spotting of the sepals.

Helleborus corsicus—the Holly-leaved Hellebore. The sharply toothed leaf margins give this species its common name.



The Hellebores

A. E. LUEDY*

Passing strange are the hellebores. We humans look about us occasionally and say, "It takes all kinds of people to make a world." That is our way of accepting, with some degree of tolerance and complacency, those who differ from ourselves. Nonconformists are found in the plant world, too. Take the large family of buttercups, to which hellebores belong. Some of its members, such as the delphinium and columbine, have downright peculiar petals; and some, like the clematis, have no petals at all. The hellebores have not only singular petal construction but an odd habit of blooming in winter and sleeping in summer!

THE LENTEN ROSE

Among the hardy perennial hellebores, the Christmas Rose is the most familiar, and an enchanting flower it is in the winter garden.** But there is an equally showy species, *Helleborus orientalis*, given the common name of Lenten Rose because it blooms in late winter and early spring. Like the Christmas Rose, it blooms in weather too inclement for most other flowering plants and thus provides a gay and graceful note in a winter-weary garden. The Lenten Rose has three to five or six nodding flowers to a stem, and unlike the Christmas Rose, it comes in various colors—no vehement hues to be sure, but in subdued tones from the ivory and greenish white of the variety *Ariadne*, through

the soft rose of the tall *Albert Dugourd*, to the purple-mauve of *M. Prosper Perthus*. One of the deepest colors is the rose-purple of *H. orientalis atrorubens*, the earliest bloomer and often miscalled "Red Christmas Rose." This may be as good a place as any to say that one sure way to distinguish *H. niger* from *H. orientalis* is to note the way the flower bud emerges from the ground—the point of the Lenten Rose bud breaks through the ground; the neck of the Christmas Rose bud emerges first.

The distinguishing color in all hellebore flowers appears in the sepals; such color is due to flushing, spotting and striping. The petals of all are small green horns or tubes measuring one-quarter inch or so, arranged in a circle surrounding stamens and pistil. The nectar of the blossom is located at the base of the petal and bees in searching it out insure fertilization. When pollination is completed, the petals fall away and the sturdy sepals remain on the flower to protect and nourish the maturing seed pods. The color of the sepal changes during this period from its initial hue to an even green.

The seed pod of all hellebores is a free standing carpel. The number of carpels varies, and from few to as many as seventy ripe shiny black seeds may be ejected from each flower. Usually the current season's crop of seed is all ripened and dispersed by mid-June and the plants are dormant over summer. Viability of all hellebore seed is quickly lost and seed should be planted as soon as ripe. Seed collected in late spring germinates early the next spring. A mild winter and spring will allow earlier germination.

The general construction of all hellebores is similar—a blackish brown rhizome with leaf stem and scape arising from the end of each branch of this underground stem. Slender fleshy rootlets

*A. E. Luedy is a nurseryman in Cleveland, Ohio, who has specialized in the Hellebores for over thirty years, and, with Mrs. Luedy, has written *The Christmas Rose*, an attractive and very interesting 44-page, illustrated, cloth-bound book. [Copies available at \$1.50 through the Society.] They are active horticulturists and photographers who do professional lecturing on garden subjects.

**See "The Christmas Rose for winter flower" by Karl F. Fischer, *The National Horticultural Magazine*, January 1958.



*Helleborus
cyclophyllus*

*A rare species,
with leaf segments
arranged in a
circle.*

Helleborus foetidus—the Bearsfoot Hellebore. This species has slender leaf segments and a huge flower cluster.





The seed pod of all hellebore species is a free standing carpel. Flowers may have from a very few to as many as seventy ripe seeds.

† *Helleborus orientalis* †

The carpels soon dry, twist slightly and split to allow the seed to escape by dropping to the ground when ripe.



(ALL PHOTOGRAPHS FURNISHED BY THE AUTHOR)

descend vertically from the rhizome to feed and anchor the plant. Foliage is variable to some extent among species. Leaves of the Lenten Rose are palmately divided, lighter green and less leathery than those of the Christmas Rose, but larger and with a taller stem. Well grown plants in a good year may be sixteen inches tall. With the exception of *H. viridis*, all hellebores mentioned here are "evergreen." That is, new leaves, (the "eyes" have been growing underground since autumn), appear in late winter and early spring and persist through the following winter. Thus the foliage is handsome in the garden when the plant is out of flower. Dry leaves are cut away when new ones appear.

PROPAGATION

Propagation of the Lenten Rose is by seed and division. Since mature Lenten Rose seed is usually dispersed under more favorable weather conditions than that of the Christmas Rose, seedlings appear in goodly numbers under old plants that are well grown; scantily under the Christmas Rose. Seed that falls to the ground one spring and germinates the following spring will, in a good growing year and with ample moisture, produce seedlings by mid-June with two or three small true leaves ready for transplanting.

Hellebores do not come true from seed, however, and quite worthless seedlings that flower sparsely or not at all often result. There is wide natural hybridization even among species. This opens the way for interesting work in hybridizing under cultivation. Improved strains can be obtained both by hand crossing and by selection from natural crosses. An example is a very handsome Lenten Rose growing now in our gardens, with magnolia-purple sepals and showy ivory stamens, five to eight, three and a half inch flowers to each tall stem, and with leaves measuring as much as fourteen inches across. To perpetuate such a strain, it must be propagated vegetatively—by division. Divisions are best made in fall or early spring while the plant is active. There is more chance of transplants drying up if divisions are made in the summer dormant period. Amply large divisions should be made, since they are slow growing.

CULTURE

Culture of all hellebores, with the possible exception of *H. corsicus*, is the same. They like partial shade; the hot sun of summer is not to their liking and if subjected to bitter spring winds, the new leaves may burn and perish. They can be planted in the shade of *deep-rooted* trees and in the foreground of shrubs that are not too rampant, so that they will not need to compete beyond their strength for food and moisture. Planted ten to twelve inches apart, they should remain undisturbed to reach their greatest beauty, not dug up and divided every few years as are many other perennials. They are slow growing and transplanting and division will set them back.

A good garden loam is all that is required, either neutral or slightly alkaline, not acid. The hole should be dug sixteen to eighteen inches deep, with good soil all the way down to accommodate the long roots. The roots are planted down, not spread out. For fertilizer, each plant will take a small handful of bonemeal, or a little superphosphate, mixed well with the soil. In the spring when new leaves come and before flowering, manure water or commercial fertilizer in solution can be used to advantage. After planting, any digging and hoeing should be avoided so as not to cut off the creeping underground stalk. The crown of the plant should be just under the surface of the soil.

GOOD DRAINAGE ESSENTIAL

Plants should be watered well after transplanting. If the season is dry they should be given plenty of water in fall and spring. In the summer the plant is dormant and wants to rest, and we should not make the mistake of watering it constantly. Above everything else, hellebores want *good drainage*—plenty of moisture, yes, but those long roots are fleshy and if kept standing in water or if in an excessively peaty or humusy soil that constantly retains too much moisture, they will surely rot. In rainy seasons, slugs may mar flower buds; in dry seasons spider mite occasionally attacks leaves; but we have found that faulty drainage is far and away the greatest cause of failure with hellebores. Mulches

of peat, stone chips, and the like, or ground covers such as myrtle, pachysandra, and dwarf ferns will maintain a cool earth and prevent over evaporation.

OTHER HELLEBORES

The Lenten Rose and the Christmas Rose are the two most handsome hellebores, but the green flowered types are alluring. Green is a color with a feeling of sheltering quietude—in ancient rites it always represented the eternity of nature—and today plant collectors and flower arrangers take immense delight in all rare green blossoms, among them the green hellebores. The most easily grown of these is *H. foetidus*, flowering in late winter, and the only one with a true stem that is branched above ground. The segments of the leaves are more slender and the flowering stem bears a huge cluster of small cup shaped green flowers edged with reddish brown. Although saddled with the species name *foetidus* and in spite of the fact that English writers, in whose country the plant is native, come out flat-footed and call it the “stinking hellebore,” we discern nothing more unpleasant than a rather alder-like pungency. The plant is also commonly called Bearsfoot Hellebore due to the shape of a leaf bract on the flowering stem. *H. foetidus* is prone to die suddenly, usually following flowering, but it produces quantities of seeds and seedlings so that new plants can be kept coming along as replacements.

H. corsicus has yellowish green leaves, prominently veined. Being sharply toothed on the margins, it earns its common name of Holly-leaved Hellebore. Native to Corsica and Sardinia, it is also called Corsican Hellebore and is frequently grown in pots under that name on the West Coast, where it can be well grown. Here in northern Ohio, we have found it to be less robust than the others. The yellowish green flowers grow in the manner of those of the Len-

ten Rose, but are often winter-killed here. The plants seem to do somewhat better in a lighter soil and with less shade than our other hellebores. If we were to choose, we would assign the name “foetidus” to this species, for brought into a greenhouse to bloom it is, to be blunt, unhappily redolent of skunk.

H. cyclophyllus, on the other hand, has a delightful light sweet fragrance, unusual with hellebores. Here the leaves are very large and the segments arranged in a circle. The stems are taller and the flowers larger than the other green flowered types. Blooms appear in spring in the manner of blooms of the Lenten Rose. It is a rare species.

The deciduous hellebore is the St. Patrick's Rose, *H. viridis*, whose yellow-green flowers bloom, as the common name indicates, about mid-March. Leaves appear in spring after the flowers, but grow rapidly and soon hide the flowering stem and its maturing seed pods. In the fall the leaves die away so that the place of the rhizome is unmarked until spring.

The hellebores are a plant group with a long and exceptional history. Tinctures and infusions were made from the rootstock of hellebores and highly prized by ancients in medicine. These provided a powerful narcotic that was used to treat men and animals, but used with great care because they were also violent poisons. *H. viridis* contains the poisonous principle in the greatest amount and is thought by some to be the “black hellebore” referred to in ancient herbals. Although poisonous when taken internally, no harmful reaction from hellebores has ever been experienced here in handling thousands of plants over some thirty odd years.

Yes, strange these hellebores may be, but they have the distinguishing marks of quality—unfailing vigor, unique and beguiling beauty.



MALBY ©

Campanula garganica

Campanula muralis

MALBY



Attractive Perennial Campanulas

ROBERT M. SENIOR*

Campanula
poscharskyana



The genus *Campanula* is a large one. There are about three hundred species all indigenous to the northern hemisphere. They vary in height from only two or three inches to four and five feet. There are plants that will thrive in any location, some in the wild garden, others in the rock garden or in the border. Possibly the two that are best known by all amateur gardeners are the "Canter-

bury Bell" and the "Harebell," or as it is sometimes called, "The Blue Bells of Scotland." The latter plant, scientifically known as *Campanula rotundifolia*, can be found in innumerable regions of North America, Europe, and Asia.

If you are not familiar with the characteristics of the genus, I might mention that all have a milky juice, all have a one piece corolla with five lobes, five

stamens, and five sepals. The flowers vary in color from deep purple to violet, lavender, and white. There is even a sulphur colored annual growing in Syria and Palestine. Some flowers, like the above mentioned Harebell, are distinctly bell shaped, others are rather flat or saucer shaped.

In the course of a lifetime, we have probably raised in the neighborhood of a hundred species. Some of these have lived for years in our garden; others, particularly those of the high mountains, often perished after the first year. In this article, however, it is my intention to mention only plants that have remained with us for several years. Here in the Ohio valley, with our variable winters and frequently hot dry summers, it is almost impossible to grow some of the species indigenous to the high Alps, such as the delightful *C. moettiana* and *C. cenisia*.

CULTURE

All of the campanulas are growing in light, well drained soil. A heavy clay soil would probably be fatal to most. Some low growing species suitable for the rock garden, do best lodged between rocks, or in wall crevices. We find here that they are better able to survive if planted where they do not receive sun all day in summer. With these low growing species we avoid a southern exposure. Like so many low growing rock plants, they dislike a location under trees. They are all growing in soil that has a neutral or alkaline reaction. This year some started blooming in May, and the flowers were at their height about the middle of June. By the second week in July most of the plants had shed their flowers.

Nearly all the seeds of the campanulas are tiny, and if sown in the open ground are likely to be washed away or buried too deeply to enable the seedlings to push through the soil. We generally sow them in pots which are then plunged in the coldframe, under a slightly raised sash. We usually plant most of our seeds in January, in order to ensure prompt germination in the spring. Whenever it snows, we raise the sash: for the seeds of rock plants in particular, snow seems to speed germination.

LOW GROWING KINDS

Of the smaller campanulas, suitable for the rock garden, our favorite is *C. garganica*. It has all the qualifications of an outstanding low growing plant. It is hardy, compact, and, when in bloom, is almost a sheet of erect, saucer-shaped, violet colored flowers. We must have raised the plant from seed fully fifteen years ago, and though in that time we have occasionally divided it, or changed its position in the rock garden, it has always thriven in some rock crevice or sloping ground.

If a novice at gardening were to ask which is the most indestructible low growing campanula I should unhesitatingly name *C. poscharskyana*, sometimes called the Serbian Bellflower. It has violet colored flowers with deeply cut lobes that are somewhat more erect than those of *C. garganica*. It is also a bit taller, and somewhat more invasive, but with us not enough so ever to be troublesome. At one time a lilac colored sport appeared in our garden. We managed to propagate this, and over the years, we have sown seeds of the offspring. Through a process of selection, we have developed a variety that is almost white, but still has a slight pinkish-violet cast. We are still hoping that in time we may secure a pure white variety.

Another low growing plant that we have had for years is *C. raddeana*. It has good sized, bell-shaped flowers with slightly recurved lobes, and the color is a rich purple. The wiry brown stems are drooping, and about six inches long. The fairly small leaves are glossy green, dentate, and rather heart-shaped. Our plants are placed on a slope, with a western exposure, where, year after year, they slowly spread. Given a light garden soil, and some protection from the mid-day summer sun, I believe this species would grow equally well on level ground.

C. portenschlagiana is a delightful little plant with a name that is rather hard to remember. In former days it was generally known as *C. muralis*, and in fact it is often so listed in the catalogues of many nurserymen today. It is a low growing plant—much smaller and more compact than *C. poscharskyana*, with erect, violet colored, bell-shaped flowers, that have slightly recurved lobes. The

name *muralis*, meaning "growing on walls," suggests at least one of the positions to which it is ideally suited. Our plant is placed between rocks on a slope facing northwest where it gets the late afternoon sun in summer.

The Harebell, *C. rotundifolia*, is probably too well known to require any description. A plant as widespread as this one will vary somewhat in different sections of the world. I have observed one growing in Michigan that was about two feet high; on the other hand, one that we found on a high mountain in Colorado, was only a few inches high. The plant in our garden is a bit over one foot high, and in June and early July is covered with bloom. It seems to be indestructible.

One of the daintiest of all campanulas is *C. cochlearifolia*, which is often listed in the catalogues of nurserymen as *C. pusilla*. It has rather small glossy leaves, above which the delicate goblet-shaped flowers with short lobes, dangle on frail stems. The color of the flowers may vary from a rich violet to a light smoky blue, and there is also a white variety. The plant cannot stand as dry a location as *C. poscharskyana*, but given some moisture, and a somewhat shady position, possibly in some crevice or rock wall, it will rapidly send out underground runners. These with us, are easily kept in control. There is a delightful variety, called Miranda. If you have an alpine house where it never need suffer from drought, a single plant will rapidly widen in girth, and in June bear scores of charming graceful flowers.

C. carpatica, a native of the Carpathian Mountains, has larger flowers than any of the plants above mentioned, and sometimes attains a height of fifteen inches. The flowers, on rather long stems, are somewhat saucer shaped, widest at the mouth, with short broad lobes. The color may vary from purple to light violet. There is also a white form. In our garden it receives sun the greater part of the day, and has a longer flowering season than most of the low growing campanulas—usually being at its best about the end of June. Whereas *C. carpatica* has stems that branch, there is a variety of this species sometimes listed in catalogues as *C. turbinata*, which

is lower growing than the species type, and is unbranched, with one flower terminating each stem.

C. collina is about a foot high, bearing bell-shaped flowers that are slightly drooping and of a purplish hue, with lobes that are cut nearly half their length. Farrer considered it one of the most beautiful of the low growing species. We grew it for several years on a sloping rock wall with an eastern exposure, but one summer when we were on vacation, possibly due to neglect or the depredations of slugs, it finally succumbed.

If you have never raised any of the low growing campanulas, I suggest you try two or three of those that I have mentioned. If after that experience, you became a campanula enthusiast, there are innumerable other attractive species with which you can experiment, such as *C. allioni*, *C. betulaefolia*, *C. pulla*, *C. parryi*, *C. tridentata*, *C. rainieri*, *C. fragilis*, *C. waldsteiniana* and *C. tommasiniana*. The last two are not difficult to grow, but with us, the others have been raised only in our little alpine house; here, *C. betulaefolia*, with pink flowers, and *C. fragilis*, that droops over the bench for a distance of two feet, are the longest lived. The last named, when in bloom, is a glorious sight, with scores of very large, rather flat violet colored flowers.

TALL SPECIES

Of the taller species, attaining a height of more than fifteen inches, I should unhesitatingly select as our favorite *C. persicifolia*, sometimes called the Peach-leaved Campanula. It is an excellent plant for the border. Plants raised from seed may vary in the size and color of the flower, which usually has a bluish-violet cast. There is also a white form. The erect, unbranched stems may sometimes attain a height of almost three feet, and usually bear several large flowers to a stem. Gradually good sized clumps may become established, and these should be divided every year or two, else there is danger of the plant deteriorating. A number of excellent varieties have been introduced, and we have raised several, such as Telham Beauty, and a delightful white variety, Moerheimi.



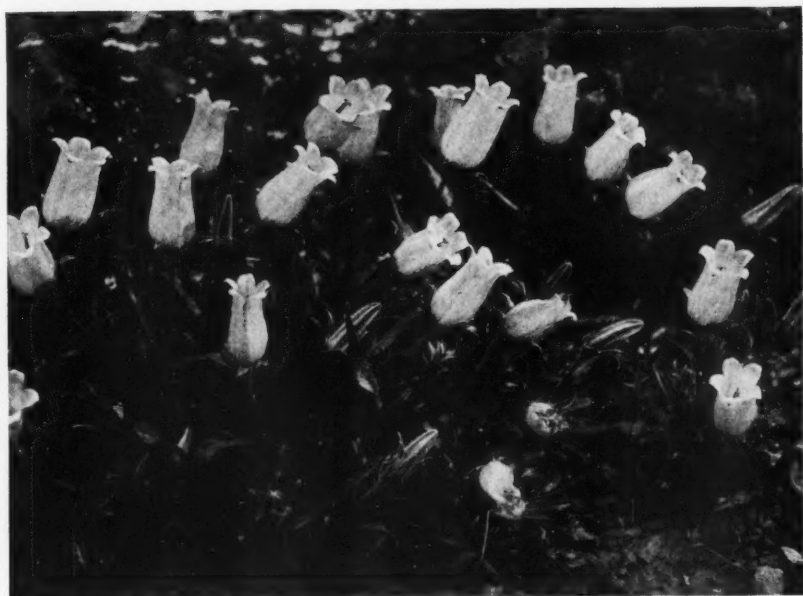
Campanula collina

P. J. VAN MELLE

*Campanula
fragilis*

*Cascading
from a
wall*





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Campanula allioni

Campanula waldsteiniana

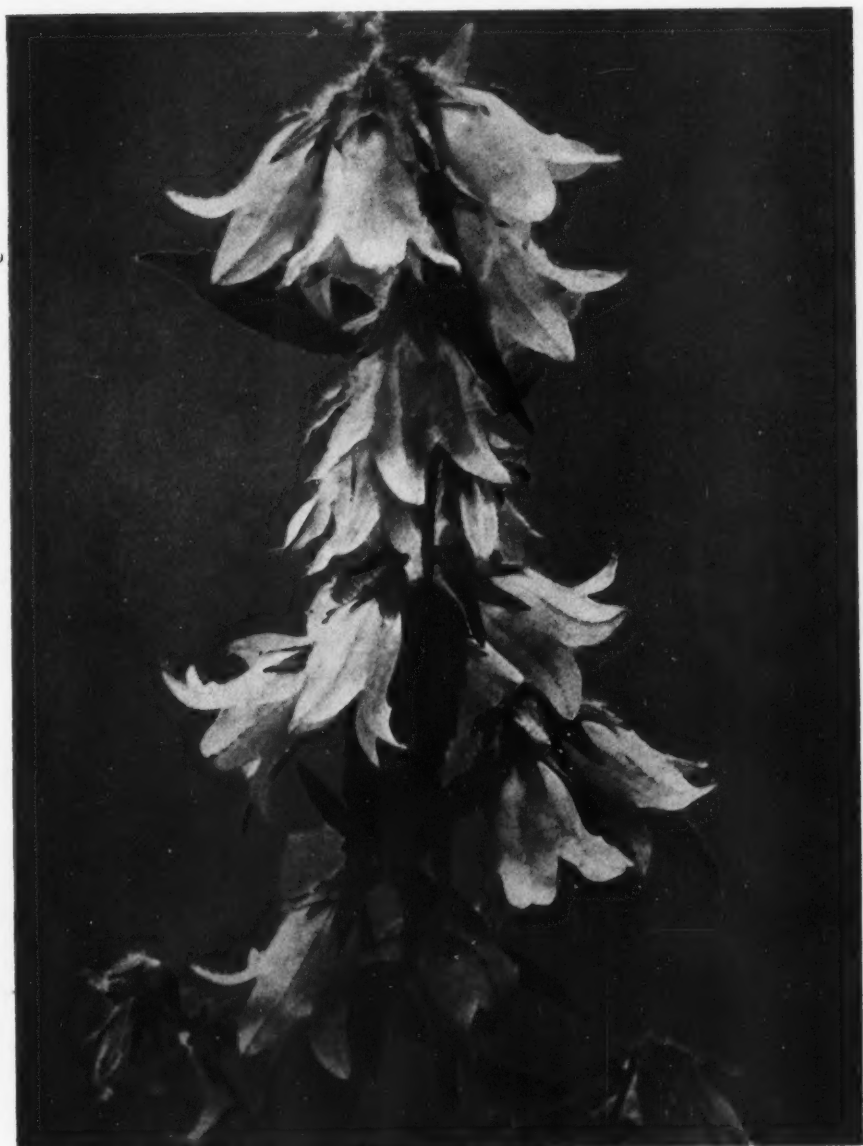
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LILIAN A. GUERNEY

Campanula glomerata

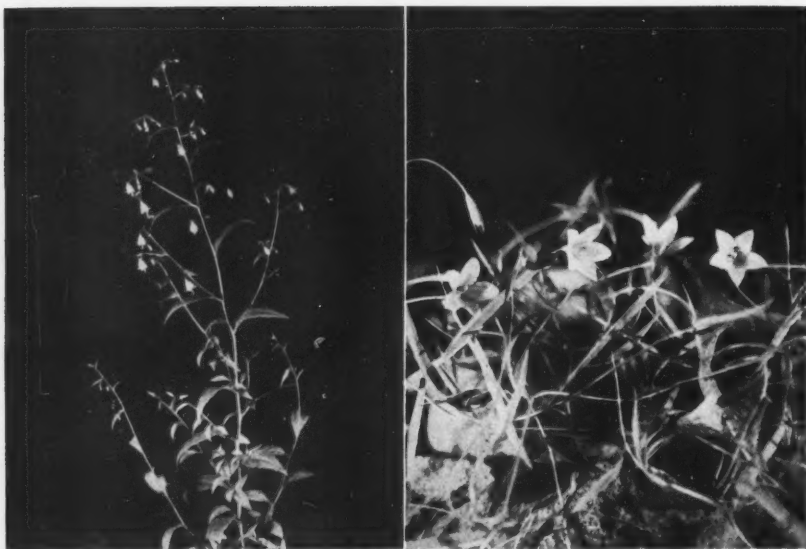


WALTER DEERE WILDER

Campanula groszekii



CLARENCE LOWN

Campanula tommasiniana*Campanula divaricata**Campanula parryi*

Another plant that can be used in the border is *C. grandis*, sometimes called *C. latiloba*, which latter name is a synonym. It is in some respects similar to *C. persicifolia*, but to my mind, is not so graceful, and has larger coarser leaves. It is about two to three feet high, forming an erect spike, the upper part bearing many good sized, violet-colored, saucer-shaped flowers on very short stems. We had the plant for several years, but during a particularly wet winter it finally disappeared.

C. glomerata might also be used in the herbaceous border. This species also sends up a number of erect stems, usually about eighteen inches in height, bearing rather tight clusters of violet bell-shaped flowers at the top. If you should raise it from seed you may be pleased with it, or may find it of inferior quality. Since it is rather widespread throughout Europe, you can readily understand that many forms of it can be found. There is a variety called *C. glomerata* var. *dahurica* which we once raised that was a particularly good form.

C. divaricata is a native plant about two feet high found growing wild in Virginia and neighboring states. Although the violet colored flowers are small, and the plant, with thin dangling bells, has a rather frail appearance, it has a distinctive charm. An English author states it is "one of the few American Campanulas that is worth bothering about." I believe the plant does best when it gets considerable shade during the day, and is planted in a soil that has a neutral or slightly acid reaction.

It might be well to warn the reader that *C. rapunculoides*, sometimes called the Creeping Bellflower, is one of the most invasive, most indestructible plants we have ever raised. It sends out roots in all directions, and if you dig it up, leaving a tiny rootlet in the soil, you will soon find another plant springing up. For years we have tried to eradicate it. When in bloom it is not unattractive, about three feet high, with good sized drooping violet flowers. One of its distinguishing characteristics is the recurved calyx lobes of the flower.

There are several species that may attain a height of four feet, but some of them are rather coarse looking. Of these tall plants, our favorite is *C. lactiflora*, which can be placed to advantage toward the rear of the herbaceous border. Several clumps would also look attractive if massed in front of shrubs or evergreens. From the base, the plant sends up a number of erect stems, which bear loose panicles of light milky blue, erect, bell-shaped flowers, with broad pointed lobes.

There are other tall growing, long lived campanulas, such as *C. trachelium*, *C. grosseki*, and *C. bononiensis*, that are sometimes cultivated. In this article, however, I have only described those perennials that we particularly favor, and which, without any coddling, should succeed in most gardens.

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PANULACEAE.



Strongylodon macrobotrys

*The Philippine Jadevine, growing on a pergola, showing
the long pendent racemes of flowers.*

The Philippine Jadevine

MONA LISA STEINER*

Flowers come in all hues of the rainbow, but seldom does nature produce a more unusual tint than that of the jadevine flower, *Strongylodon macrobotrys*. The term bluish green hardly does justice to the glowing and luminous color which can be compared with the transparent and opalescent tinge of the sea around coral reefs. Anyone who sees for the first time the long pendant racemes about three feet long, covered over and over with large crescent shaped flowers, is stunned by the exquisite beauty of these rare blossoms.

Although native to the Philippines and first described in the year 1854 by Asa Gray in *Botanical Expeditions of Wilkes, United States Expedition*, it has become popular in the Philippines only in the last few years. Hugh M. Curran, professor of tropical forestry, was the first person to discover its horticultural value. In 1937, while walking on Mt. Makiling with his daughter Polly, he found the seeds of the jadevine, and later planted them in his garden in Los Baños. Mt. Makiling, only an hour's drive from Manila, is a National Park. On its slopes lie the Bureau of Forestry of the Philippine Government, and the College of Agriculture of the University of the Philippines. Although Professor Curran was interned during the last war with all other Americans in this country, and his home was burnt like all the other houses and offices in Los Baños, the jadevine lived on.

Strongylodon macrobotrys is a strong growing perennial climber with thick, twisted, rope-like stems, spreading its large pendant racemes on canopies of high trees. It is found in damp ravines and forests of low and medium altitude in Luzon and Mindoro, but has, so far,

not been reported from other parts of the Philippines. Locally, it is called *bayo-u* (in Battan), *buracan* (in Mindoro), and *tayabak* (in Tagalog). *Strongylodon macrobotrys* has trifoliate, pinnate, stipulate, glabrous, pale-green leaves which are almost reddish when young, but dark green and glossy when mature. The petiole is about two and a quarter inches long and the lower half-inch is thickened and curved. Leaflets are about four to five inches long and two to two and a half inches wide. The middle leaflet is elliptic, while the lateral ones are oblique with three prominent veins; apex is mucronate, base obtuse, and oblique on the lateral leaflets. The inflorescence is a fascicled raceme about two and a half to three feet long. The rounded calyx teeth, typical of this genus, have given this group the generic name, *Strongylodon*, from the Greek meaning "round" and "teeth."

The characteristic floral feature of this genus of the *Leguminosae* is the short wing, adherent to the keel, which is beaked and strongly recurved, equalling the standard in length, and connate with the petals. The standard is ovate oblong, acute, recurved, finally reflexed with two appendages inside above the claw. The individual flower is about two and a half to three inches long. Most unusual in this family is the indehiscent pod about the size of a child's head, fleshy and hard with three to ten seeds, which are large and stony.

About twenty species of this genus are known of which ten occur in the Philippines. Nine of these are endemic or confined to the Islands and only one of the Philippine species is also found elsewhere. The genus is distributed from Madagascar to North Australia. The following species of *Strongylodon* are reported from the Philippines: *agusanensis*, *caeruleus*, *crassifolius*, *elmeri*, *lucidus*, *macrobotrys*, *megaphyllus*, *paucinervis*, *pulcher*, *zschokkei*. The last is probably only a synonym of *macrobotrys*. *Strongy-*

*The author is a trained botanist (Ph. D., University of Vienna) who has resided in Pasay City, Rizal, Republic of the Philippines, for the past twenty years. Active in horticulture as well, she is one of the founders of the Philippine Garden Club and the Philippine Orchid Society. Among her publications are *Philippine Orchids* and *Philippine Ornamental Plants*.



Strongylodon macrobotrys seed pod

*The seed pod of the Philippine Jadevine opened to
illustrate the large stony seeds.*

Iodon lucidus is the only indigenous species also found outside of the Philippines.

Key to the more common Philippine species of *Strongylodon*

Inflorescence branching	<i>lucidus</i>
Inflorescence not branching	
Racemes more than two feet long	<i>macrobotrys</i>
Racemes less than two feet long	
Tendrils circinate	<i>crassifolius</i>
Tendrils not circinate	
Rachis one-eighth to one-fifth an inch wide	<i>elmeri</i>
Rachis one-fourth to one-third an inch wide	<i>caeruleus</i>

All these species have horticultural possibilities, especially *lucidus* with orange-red flowers, and *caeruleus* whose flowers are bluish-purple. Of the latter, a few specimens are in cultivation at the College of Forestry Nursery at Los Baños, but so far they have not yet been flowered in Manila.

Like most members of the LEGUMINOSAE the jadevine and its relatives are best propagated by seeds, but care must be taken to plant them as soon as possible, because their viability is very short. Seeds are best soaked overnight, after which a slight incision is made to aid the germination of the new seedling. They may be propagated asexually by marcottings and layerings; cuttings do not strike roots readily.

Pergolas are the best support for the jadevine; when planted along a wall or flat support the green flowers do not stand out too strongly against the green foliage. If the leaves and branches are neatly trained along the pergola the long hanging trusses can be best appreciated. Flowers are mostly produced from February to November, but in Los Baños the vines are flowering almost throughout the year. It takes generally three years until flowers are produced, as the plant is a rather slow-growing vine.

Blooming of the flowers is basifugal with the lower buds opening first and those at the apex last. One inflorescence stays covered with flowers three to four weeks. Individual flowers, however, last only two days, and consequently well

established jadevines always produce thick carpets of blue-green, fallen blossoms on the ground. Since the flowers occur very close together there are sometimes almost a hundred flowers on one large stalk.

Buds and blossoms are frequently visited by black ants, and also by aphids, which sometimes cause the buds to fall before they open. Another visitor that has been repeatedly observed in gardens of Forbes Park, Makati, a suburb of Manila, is a bird, the orange-breasted flower pecker [*Dicaeum trigonostigma*] with a short well-curved bill. Small insects are part of its diet and the ants might be their prey. Injured blossoms are sometimes seen on the ground obviously pecked by the bird.

Since the long-hanging flowering stems do not last long when cut, in comparison to those on the living plant, jadevine trusses are seldom cut, but the fallen flowers are frequently used for leis and flower arrangements. Thin pliable broom-straws are often inserted into the base of the flowers and these are properly placed in an arrangement with driftwood and coral. Some people float jadevine blossoms in flat vases with a small figure as centerpiece and some foliage.

Mucuna bennetti, a bright-red flowering vine from New Guinea, resembles in habit the jadevine; however, botanically speaking, keel and wings are larger than the standard in *Mucuna*. From a horticultural point of view, both the blue-green jadevine and the bright-red *Mucuna* would form an ideal vine combination that could hardly be surpassed if grown side by side on a pergola. Undoubtedly, the jadevine will in time become just as coveted and admired outside of the Philippines as it is in its home country. It should also be a potential subject for the tropical conservatory in temperate lands. Its unusual color, floriferous habit, and large flowers—all desirable qualities—will also attract plant breeders, who are always on the look-out for new and stunning characteristics.

A Book or Two

Flowers of the World in Full Color.

Robert S. Lemmon and Charles L. Sherman. Hanover House, Doubleday & Company, Inc., Garden City, New York. 1958. 280 pages. Over 600 New and Original color plates. \$7.50. (Library).

Flowers of the World in Full Color describes and illustrates many of the flowers found in American gardens in an interesting combination of illustration and text—the story of their origin, history, and relationship. Nearly six hundred color transparencies of the flowers that are reproduced, mostly pictured in a detailed and close-up view, represent a selection from eight thousand transparencies taken over a five year period by Mr. Sherman and Roy Goin. There are full page garden plates, these from the excellent work of Paul E. Genereux and F. W. Cassebeer. Mr. Lemmon is responsible for the text. The printed results are the finest on the market today.

There are two main sections of the book: Flowers of the Old World, and Flowers of the New World. Each of these is divided into those kinds of the temperate zone and those of the tropical zone. The book is very attractively arranged and easily read. It contains many interesting facts on plants which should appeal to any person for whom plants have an attraction.

C. B. L.

Pharmacognosy.

E. N. Gathercoal and E. H. Wirth. Third Edition, extensively revised by Edward P. Claus. Lea and Febiger, Philadelphia, Pennsylvania. 1956. 731 pages. Illustrated. \$12.50.

The advent of a new book on pharmacognosy would once have created a profound stir among all contemporary horticulturists, and, likewise, botanists, for pharmacognosy and horticulture composed the partnership from which botanical science emerged. In recent years pharmacology, constituting the applied phases of the descriptive science, pharmacognosy, has gone chemical and medical so largely that its botanical origin is only vaguely recognized by modern horticulturists. Opportunity to renew this acquaintance is now provided by this comprehensive treatise on pharmacognosy in all its aspects—botanical, chemical, and medical. It offers fascinating reading to all who have a broad interest in plants,

and this notice aims to direct attention to it as the season approaches (and with many of us, also that stage in life) when armchair horticulture is welcomed.

If you are disposed to learn how the cultivation and utilization of drug plants have fared in this age of antibiotics and vaccines, and also seek acquaintance with modern chemical understanding of the nature and properties of drugs, this book will reward some serious browsing. The discussion of antibiotics, vitamins, and vaccines must appeal to all who have occasion to use these products—and who doesn't nowadays. To appease the strictly horticulturally minded there is a chapter on drug plant cultivation and a fine color plate of *Rauwolfia serpentina*, currently of much interest as the source of one of the most successful hypertension-relieving drugs.

F. A. W.

Roses.

F. Fairbrother. Penguin Books, Baltimore, Maryland. (prepared in conjunction and collaboration with the Royal Horticultural Society, London, England.) 1958. 180 pages. Illustrated in color and black and white. \$95. (Library).

This is announced as the first of a series under the cooperation indicated above. There is an excellent brief Foreword by the President of the Royal Horticultural Society, and a clear statement by Mr. Fairbrother as to what he intended to do in the text. This last he most certainly accomplishes.

Although there is a wide recognition of varieties of roses produced in this country, as well as in many others, the treatment through out is planned and intended for use in the British Isles. Some of the data presented will be of little use here, but the balance should offer a clear outline of how one should approach the growing of roses.

Since any book on the subject must cover the identical material, it is no criticism to say that the author has been over the familiar ground once more and brought in what are the newest principles, for him, and done it all in a lively and engaging manner.

The printing is clear and excellent, and the whole volume is as handsome as one would expect from Penguin books.

B. Y. M.

(Books available for loan to the Membership are designated: (Library). Those not so designated are in private collections and are not available for loan. Books available for sale to the Membership are designated with the special reduced price and are subject to the usual change of price without notice. Orders must be sent through the American Horticultural Society accompanied by the proper payment. Please allow two to three weeks for delivery.)

The Art of Flower and Foliage Arrangement.

Anna Hong Rutt. The Macmillan Company, New York, New York. 1958. 248 pages. Illustrated (Photographs by Elemore Morgan.) \$5.95. (Library). AHS Members' Price \$5.06, when ordered through the Society.

This book is very worthwhile reading. The author's clarity of presentation makes enjoyable whatever she has to say. One has the impression that all possible questions in the readers' mind are anticipated and honestly answered. There is no vague thread in this book, it is factual, instructive and up to date.

The book is divided into eight parts, five of which are most valuable to all those who are thirsting for thorough knowledge in regard to flower arrangement. Since most interested people are aspiring to become practitioners, the sections presenting the art principles, the art elements, expressiveness, and types of arrangements hold extensive and easily understood information. Through them the author reveals experience, knowledge and broadminded and analytical understanding. Her presentation of occidental and oriental styles of flower arrangement is interesting, creating an appetite for further study. Her summation of all the known tricks of preparation and preservation of plant material is most helpful through careful and specialized instructions. Anyone, who wants merely an understanding of what visible and invisible factors are at work in the creation of art with plant material, will wish to know this book as a comfortable reference. Other parts, which are geared to those readers who seek tutelage from a book, offer a wealth of clearcut and direct instructions, inviting a study.

A number of the illustrations hit the inspirational level. The author, however, obviously wishes to teach and bring out given points in her text by visual means. She has, in most of her pictures, illustrated a point rather than created a breathless beauty which commands instant eye appeal, but extra hurrahs for Mrs. Rutt's wise use of "Southern" plant materials—so rarely illustrated before.

MRS. HERBERT H. GREGER

Classified List and International Register of Daffodil Names.

The Royal Horticultural Society, London, England. (Distributed through American Daffodil Society, 10 Othoridge Road, Luther-ville, Maryland.) 318 pages. \$1.50. (Library).

This is the latest edition of the invaluable list prepared by The Royal Horticultural Society and takes the place of those that have been previously issued. The text still shows the same admirable clarity of expression and definition. It will be particularly valuable in this country in helping show chairmen attend to the correct classification of varieties, although this is a secondary use of the volume. The historical value of the early pages is greatly increased by the addition of bits of information about the raisers and breeders and stock holders, a list that is not absolutely complete, as is indicated by the sub-heading.

The Art of Drying Plants and Flowers.

Mabel Squires. M. Barrows and Company, New York, New York. 1958. 258 pages. Illustrated. \$4.50. (Library).*

Quite a number of books have appeared on the market in recent years on this fascinating subject—and many of them have passed through the hands of the reviewer without much inclination to retain them, except for this one.

Clear instructions are given, with well arranged tables, for the preserving of foliage, flowers, seed pods, cones, nuts, and which methods are the best in each case, together with the approximate time it takes to finish the process. A list of sources for dried plant materials for those who, perhaps, do not have the space to store materials while drying, or can not obtain the plants growing within the home base, is given at the end of the book.

F. P.-K.

*An abrupt squall suddenly changed the sail of the reviewer's ketch, throwing the book into the sea. She immediately dove in and recovered it, but since Mrs. Squires did not cover the *Art of Drying Books*, the Librarian will have to loan this copy with its wave-like pages. Ed.

Evergreen Orchards.

William Henry Chandler. Lea & Febiger, Philadelphia, Pennsylvania. 1958. 535 pages. Illustrated. \$8.50. (Library).

This is a revised, second edition, of Dr. Chandler's earlier work. It should be looked upon as a reference work, for use in all parts of the world as it cites conditions in which the crop trees are native as well as treating of what conditions in this country give an approximate parallel. The Preface to the edition gives the clarification of the title as referring only to fruit trees.

To most members of this Society, it will have little practical value, aside from answering their questions in case they travel in parts of the world where unusual fruits come to the "native markets" and send the traveller into ecstasies of enthusiastic inquiry as to why so and so is not grown in the United States. Some few will be met with in Florida and California, but not elsewhere and most of the rarer things are not likely to be met with in any commercial groves in this country.

For those of us who know citrus fruits and avocados and mangoes as we buy them from the stores, it should be delightful reading as much of the history of their introduction is included, and more about the problems of their successful cultivation. The banana and the pineapple have a share too, and, as these do sometimes appear in cultivation, read about them too. Cacao, coffee, tea and all the rest, are included, with spices for good measure. For us, then, this is a book to broaden the scope of our knowledge and intelligent understanding of the problems of production.

The only possible quibble for the non-commercial reader who is reading for the pleasure of it, is that the book is very heavy, due to the size and the type of glazed paper, a paper that helps in the excellence of the reproductions.

B. Y. M.

Enjoying America's Gardens.

Joan Parry Dutton. Reynal & Company, New York, New York. 1958. 311 pages. Illustrated. \$5.00. (Library).

A interesting book to read, of plants and gardens of the United States. The author describes travels and visits to gardens in all sections of the country. These include: Longwood Garden, Bartram's Garden in Philadelphia, the gardens of Charleston, New Orleans, the Mountains of Colorado, and the many gardens of the Pacific States. Into these travels she brings interesting notes of the many plants growing in the various geographical and climatical areas of America of their origin, or discovery, and the persons connected with those plants, both past and present. She visits and tells of many persons whose names are familiar to the readers of *The National Horticultural Magazine* since they have been authors of many fine articles—Mrs. J. Norman Henry, Mrs. G. R. (Kathleen) Marriage, John C. Wister, Lester Rowntree, Donald Wyman and others. A book to enjoy.

C. B. L.

The Azalea Book.

Frederic P. Lee. D. Van Nostrand Company, Inc., Princeton, New Jersey. 1958. 324 pages. 60 illustrations, 6 in color. \$8.95. (Library). AHS Members' Price \$6.45, when purchased through the Society.

This could well be entitled "A Modern Azalea Cyclopaedia," as it supersedes all previous attempts to bring under one cover, culture, care, and history of the Azalea as a subdivision of the genus *Rhododendron*. The part dealing with classification of azaleas is clear evidence of the meticulous care with which the whole book was written.

The Azalea Book can serve the rankst amateur as well as the professional and student because the first part is an accurate, yet easily read, presentation of facts concerning Azalea culture. Its easy composition will prepare the reader for a better understanding of Part II which is an analysis of the botanical characteristics and basic horticultural problems, and Part III which deals with the origin, distribution, and development of azaleas. These parts are an excellent refresher course for the professional as well as the science student. Part IV, "Descriptive Lists of Azaleas" is not only invaluable to the collector but to every nursery which cultivates azaleas for sale.

All of us classified as horticulturists will remain indebted to Frederic P. Lee for bringing together under one cover this up-to-date wealth of information on azaleas. I predict the book will long remain a standard treatise.

FREDERIC HEUTTE

Zen in the Art of Flower Arrangement.

Gustie L. Herrigel, translated from the German by R. F. C. Hull. Charles T. Branford Company, Newton Centre, Massachusetts. 1958. 124 pages. Illustrated. \$3.00. (Library).

This is a slender book, which is more the recording of a great personal experience, a testimony of devotion, than anything else. The title is perhaps a little difficult to follow as one reads, but that need not be important in the end. There is no definition of Zen in the book, understandably, since Zen is the most difficult to discuss of all the developments of Buddhist thought and practice. Perhaps it is enough to say, no matter how imperfectly one says it, that Zen is one path to the great goal of human life, the way to the ultimate Ground, the identification of the self with the Self.

To enter into the life of any people other than one's own, is difficult enough at best; to enter into the inner being and ways of thought of another people requires an even greater gift. In this Mrs. Herrigel seems to have been more than usually successful, and was more than fortunate in finding the Master whom she needed.

The present reviewer, as much as any one, is loath to put into printed form, his feelings about the great forces of life and of living, but that is the underlying theme of the book. Ostensibly, it is about a classical school of Flower Arrangements; actually, it is a record of some of the ways that go to make up the life pattern of the cultivated and spiritually minded Japanese, communicated with sympathy but undoubtedly with some loss from Japanese to German, from German to English, from printed page to reviewer, from reviewer to you. Read it for yourself, and see if you are completely happy ever again with the jargon of "containers," "material," and all the familiar words or labels of the Arranger's Life! If you are, this was not your book. It does not matter, for you are not ready for it. The underlying theme is universal life.

B. Y. M.

Garden Pools, Water-Lilies, and Goldfish.

G. L. Thomas, Jr. D. Van Nostrand Company, Inc., Princeton, New Jersey. 1958. 222 pages. Illustrated in color and black and white. \$5.95. (Library).

This is a book written from experience and personal devotion to the subject, most of it deriving from Lilypons, Maryland, where the author and his family have their establishment.

In the opinion of the reviewer who grew in his own garden all of the many tropical water lilies that were illustrated in this journal in years past, the author was wise to see that it starts off with a discussion of the work involved in preparing various kinds of pools. A considerable number of examples are illustrated both as photographs and as working drawings. Not all are equally elegant or beautiful, but the basic information is there for any one who can and will read.

Botany, history and the cataloguing with comment of the species and varieties, follows for pages, the first section devoted only to the Nymphaeas; then follow the sections on Victoria, Nuphar, and the semi-aquatics that are grown along with the water garden plants, some submerged and some on the borders with perennially wet "feet." Some readers will copy the suggestions literally and some will doubtless have their own ideas about marginal plantings, most of which are ugly and frequently interfere with the complete beauty of the water lilies themselves.

The author allows himself the misery of making various lists of "the best" and for the kind of gardener who has not much personal courage, these are invaluable. There is a good index.

The discussion of fish, is less interesting, and while the difficulty with fish-eating hawks is mentioned, there is no notation about the wading birds that often are as troublesome.

Nothing more need be said than that the reviewer wishes he knew a new pool for his garden in Mississippi was just about to be built. It is not, for the garden at present does not have enough sun! But you build one and see for yourself, the new pleasure that will be yours.

B. Y. M.

Dried Flowers With A Fresh Look.

Eleanor Reed Bolton. D. Van Nostrand Company, Inc., Princeton, New Jersey. 1958. 210 pages. Illustrated. \$6.95. (Library). AHS Members' Price \$5.91, when purchased through the Society.

Mrs. Bolton has produced a very readable and instructive book in the latest to appear on the market dealing with the preserving of plant materials. She guides the reader in the selection and preparation of flowers—explains in detail the various methods which can be employed to dry flowers, treat leaves and ferns, as well as other plant materials, to enable them to keep their form as well as their color. There are chapters devoted to preserving berries and seeds, and storage of materials, the grooming and arranging of plant materials, and some uses other than the conventional bouquets. There are also tips to the exhibitor in flower shows, and point score judging scale for dried arrangements—also, detailed description on how to take arrangements to a show—and with these fragile bouquets this is indeed a feat.

The book is very well illustrated, both in color and in black and white, with flowers in arrangements as well as many "how-to-do-it" pictures, such as the drying box showing the cardboard ridges with cutout notches for the necks of the flowers.

The success of the techniques described in this book were shown to the public in Washington, D. C., recently and they were indeed delightful: sprays of white dogwood, pink peonies, small cup daffodils, pink roses, snapdragons, marigolds, and many other hard to dry flowers.

F.P.-K.

Pruning Made Easy.

Edwin F. Steffeck. Henry Holt and Company, New York, New York. 1958. 120 pages. Illustrated. \$2.95. (Library).

This is a practical and easily read presentation of the fundamentals of pruning trees, shrubs, and vines. The plantsman may be startled to see line drawings of spruce labeled as pine on several pages; however, the other illustrations are suitable and clear in portraying the various aspects of a sometimes complex problem for the layman.

Not only has the author explained how to prune, but he has also described the intricate details of plant growth and development which will enable the reader to determine the various reasons behind the cutting techniques, as well as the resulting future development of the plant.

The author has adequately covered pruning tools and their use. He also describes the care of trees, shrubs and vines in numerous situations in landscape plantings. This publication should be a worthwhile addition to the bookshelf of the home gardener.

L. J. ENRIGHT

Window Sill Gardening.

James Underwood Crockett. Doubleday & Company, Inc., Garden City, New York. 1958. 120 pages. Illustrated. \$2.95. (Library).

This is a "chatty" sort of a book on the care and growing of plants in the home. The author starts first with a brief discussion on "How Plants Grow." This is followed with short chapters on growing the many popular flowering plants, including those kinds grown by florists, such as cyclamen, poinsettia, and azalea. In each case, suggestions are made as to how such kinds may be handled for flowering again—if that is possible, as with azaleas, gardenias, or gloxinia. The chapter on foliage plants makes suggestions as to the kinds to select for different situations, and how to care for them. Some less common flowering and foliage plants are discussed, such as primroses, miniature roses, and dish gardens. The summer care of house plants, as well as soils, fertilizers, and pest control, is discussed briefly. The final chapter concludes with a few hints on the care and use of cut flowers.

C. B. L.

Other Books Added to the Library

American Tomato Yearbook. 1958.

John W. Carncross, Editor. American Tomato Yearbook, Westfield, New Jersey, 1958. 40 pages. \$2.00. (Library).

Radioisotopes in Biology and Agriculture. Principles and Practice.

C. L. Comar. McGraw-Hill Book Company, New York, New York. 1955. 481 pages. Illustrated. \$9.00. (Library).



... to soften the lines between the structure and greensward

The Gardeners' Pocketbook

Some Thoughts on Foundation Planting

The architects who designed classical French gardens had the idea that having plants close to the house cast so much shade they would make the ground floor damp, so the shrubbery, of which there was very little, did not begin until beyond the stone flagged terrace areas. In England, oddly enough, where it is much damper than in France, people often train vines up the outside walls of their houses, a practice which enables them to give warmth and shelter to plants that are half hardy and even fragile in their northern climate. Elsewhere it has been feared plants close to the house might attract insects. However, in general where I live, namely in northeastern North America, it is customary to plant trees or shrubs close to the houses to soften the line between the brick or wooden walls and the greensward—in

other words to provide ornamentation of the land adjacent to the house. Too often the plantings consist of stiff coniferous evergreens placed much too closely not only for their own good, but also because of their natural habits of growth either in width or height, they are likely in a short space of time to crowd each other and grow so high above the windows that they shut out light and air. Always where there are windows, plants should be so low as not to interfere with light and air. And where the windows go down to the ground the foundation planting has to be at the sides where there is solid masonry behind it.

When I bought my present home, there was a huge yew on the side of the front door rising from a scattering of pachysandra. The yews hid at least one-third of the ground floor window and were clumsy in shape. Instead of trying to save them they were dug up

by a bulldozer and thrown out. This left two beds somewhat hemispherical in shape and measuring about twelve feet in width and twenty-four in length. The one nearer the kitchen entrance was slightly longer than the other. Both face northeast as does the house. They flank the main entrance wing which projects a little beyond them and casts more shade on the longer more westerly lying bed than on the other one. Consequently, shrubs and flowers bloom a week later in the shadier bed though it is only a few feet from the sunnier one. On either side of the entrance the dwarf form of Alberta spruce has been planted. It terminates in a point and has yellow-green fine foliage.

While I was building the garden, an old swamp was turned into a pond and the soil dug up in the process consisted of leaves that had been accumulating and decaying for untold years. This soil was mixed with lime, allowed to dry, and then incorporated into the two beds. In spite of this lime, members of the rhododendron family have done well here. True rhododendrons, however, except for azaleas, look so sad when it gets very cold and their leaves droop and the margins roll inward, that they have not been included in the planting close to the house.

The shrubs in the two beds are duplicated except for plants of *Ilex crenata* and *Berberis vulgaris* which grace the further end of the larger bed. At the back and closest to the windows is *Pieris japonica*. It grows up to nine feet high and has markedly toothed lustrous leaves. Closely-set flower panicles are pendulous and creamy, form in mid-summer and remain full of promise all winter until they open in very early spring. The young branches and leaves in some specimens are decidedly reddish, while in others they are on the yellow side. It is absolutely hardy with me, and the only drawback is its tendency to height which can be kept back by pruning. Its close relative *Pieris floribunda*, native to Virginia and Georgia, has the advantage of being shorter, but it is not so graceful as the Japanese plant.

In front of the pieris are some evergreen barberries hardy for this locality. I happen to grow *Berberis verruculosa* with rough yellow branches and pointed leaves that are spiny toothed, have revo-

lute margins, and are green on both sides. The light yellow flowers grow two to one hanging from longish stalks. *Berberis chenaultii* is a hybrid of *B. verruculosa* and *B. gagnepagni* and has spiny toothed leaves that are glaucous on the under sides. *B. candidula* is a third similar barberry, the handsomest of the three which has large solitary flowers and silvery undersides of the leaves. The fruits of *B. candidula* are long and slender, light blue in early fall and darken as the season advances, as do the fruits of *B. verruculosa* and *B. chenaultii*. All these barberries show some bronzing in cold weather. A few *Kalmia latifolia* bushes are here.

Placed at the far end of the larger bed is a deciduous bush handsome all winter with its dropping panicles of scarlet fruits which develop from panicles of yellow blossoms, namely, *Berberis vulgaris*. It is European in origin, but has seeded itself extensively in North America and I find seedlings all over the garden.

In front of this barberry are two bushes of *Ilex crenata*, the Japanese holly. The bush is somewhat stiff in habit of growth which can reach twenty feet unless it is cut back severely. The sexes are separate and the flowers inconspicuous. The dark green leaves are obovate, short stalked, faintly toothed and glossy, and the bush is attractive. Variety *Helleri* sounds much better than it is because of being exceedingly compact and clumpy and not the least graceful. Variety *convexa* is very like the type only the leaves being convex above and concave below, look as if some insect had laid eggs in them.

Towards the front in these two beds are many evergreen azaleas. Some of them bloom from early May and others deep into July. All have white, pink or roseate red blossoms. These, as well as other shrubs here, have to be kept low and somewhat compact.

Years ago when I began to garden, a friend told me a gardener has to be a sculptor and continually shape his plants if he wishes the picture to stay as it was planned originally. This pruning is required not to make geometric shapes of the shrubs, but to cut out old wood to the ground level and occasionally to cut out higher branches to provide space for the lower growing shrubs.

Needless to say these beds are heavily fed with compost and commercial fertilizer every year.

Some of the azaleas came from a shaded place in my other garden and evidently there were seeds and bulbs in the soil around them which have been maturing gradually. Quite unexpectedly, a spike of *Lilium elegans* appeared, the original parent of far more glorious offspring. It began with one stalk, and now forms a fairly large size clump. A few of the low growing *L. philippinense* have been planted towards the front for August blooming.

Other plants which have come along with the soil are May apples, *Podophyllum peltatum*, with their round, floppy, umbrella-like leaves, and a few of the False Solomon's Seal. Ferns, too, have appeared but they are pulled out for there is no space for them and moreover their texture does not harmonize with the glossy finish of the broad leaved evergreens. From neighboring beds violets keep popping up.

In early spring the leathery leaves of *Lycoris squamigera* appear to be followed in August by pinky mauve clusters of flowers.

At the very front of the beds and blooming in mid-March amid an edging of *Vinca minor* are snowdrops half the way; the other half is planted with *Crocus tomasinianus* with tiny flowers shading from lavender to pink. After these fade the whole front of the bed is blue with chionodoxas. By May, *Phlox divaricata* is showing the grey blue of its clumps. At the back of the beds, in shade and where they prevent mud from being splashed against the house, are mats of lily-of-the-valley. When there is a vacant spot, which according to this account would seem impossible, I tuck in pansies. Today, early in July, I was surprised to see that *Campanula rotundifolia* had seeded itself and formed a large round clump most becomingly among azaleas. The last blooms are colchicums which have been planted well towards the front. Not too many of them are here because of the conspicuous leaves they send up in spring which soon turn brown, and are difficult to hide in this place. Also, there will be a few autumn crocuses which bloom into November.

Thus it is possible to have almost an

entire garden right close to the house and in a comparatively tiny plot of ground, without any of the conventionalities of "foundation plantings!"—HELEN M. Fox, *High and Low, Mount Kisco, New York.*

Autumn Foliage Colors On Glenn Dale Azaleas

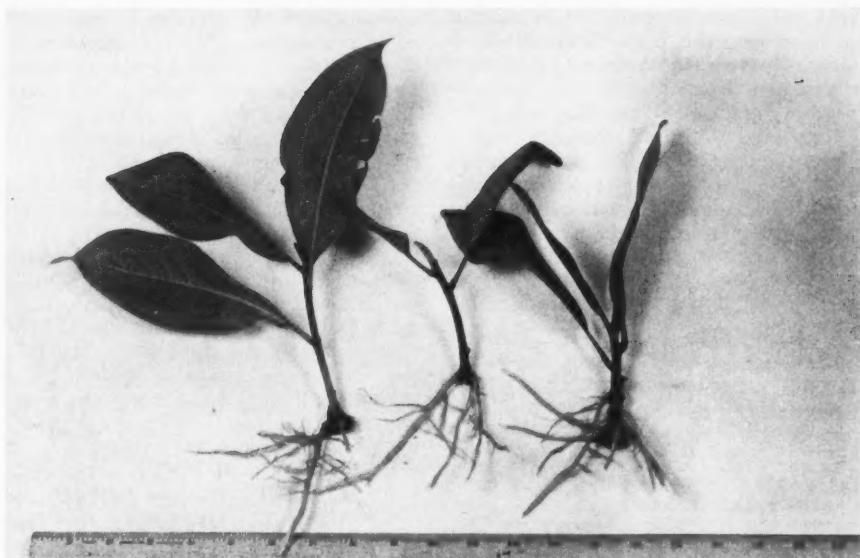
In gardens in the South evergreen foliage is just as important as elsewhere and most of it comes from broad-leaved plants rather than conifers. There is no extremely good source of gray though a form of Juniper that comes under the name of Silver Vase is a lovely blue green mass in summer, less so in winter when it loses most of the tint to plain green.

The fact that the leaves of many Glenn Dale Azaleas assume the bronze to coppery colors that one associates with mahonias in the north, makes them of interest here. The following list made in the winter of 1957-58 is of clones that color markedly, not just slightly:

Arcadia, Campfire, Chanticleer, Conquest, Copperman, Damaris, Darkness, Dauntless, Dragon, Etna, Fandango, Fashion, Firedance, Gaiety, Galathea, Glamour, Jubilee, Kathleen, Kobold, Mandarin, Manhattan, Nubian, Oracle, Padre, Phoebe, Refulgence, Rhapsody, Sambo, Token, Winner, and Zealot.

Coloration varies considerably. In some clones the leaves are colored on both surfaces, in others the reverse of the leaf remains green, but this is not a showy feature as there is little leaf movement in wind. If both surfaces are colored the under surface is usually lighter in hue. For example, Fashion shows upper surfaces of Dianine Brown, but the reverse is Vandyke Red. Winner, is almost black on the upper surface but Burnt Lake on the reverse. Campfire and Chanticleer have the same color pattern as Fashion. Damaris colors to a hue between Burnt Lake and Black, and is very striking.

All color notations are from Ridgway *Color Standards and Color Nomenclature*, which has been the writer's right hand for too many years to be abandoned, even if it does annoy the moderns.—B. Y. M., *Pass Christian, Mississippi.*



Well rooted cuttings of Magnolia grandiflora
(About 46 days old—roots 3 to 6 inches long)

Magnolia grandiflora From Cuttings

There are no hard and fast rules as to when cuttings should be taken, but it is generally suggested that cuttings of deciduous plants be taken in late spring or summer, those of broad-leaved evergreens in summer, fall or winter.

Most propagators understand the problems involved in successfully rooting cuttings of woody plants. They know that a cutting will not root if it is allowed to wilt after it has been removed from the parent plant. For this reason, cuttings are often collected in early morning while the plant stems are turgid and they are wrapped in moist cloth, plastic, or similar material to protect them from drying as they are transported to the propagating area.

It is also known that the cuttings must be kept turgid while in the greenhouse or frame if they are to be rooted

successfully and rapidly. In order to produce the optimum conditions in a greenhouse or frame the cuttings must be in a closely controlled temperature, sprayed with water at approximately two to three hour intervals on a summer day and generally protected from the wind and the heat of the sun. These factors combined with the inherent stubbornness of some plants has created a considerable problem for the average grower who has the desire to increase his favorite plants from vegetative cuttings.

With the advent of the mist system of watering cuttings, the writer made numerous attempts over a period of several years to select the proper period during the summer, fall and winter months to take cuttings of *Magnolia grandiflora* and then by stimulating them with various concentrations of chemical materials, root them under both an intermittent and a continuous spray of water.

No matter what combinations of wounding, chemical treatments, medium, or watering were used, all the cut-

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tings failed to root. It was then decided to investigate the period during which cuttings were taken to see if any time other than summer, fall or winter was suitable for the Southern Magnolia.

One season several cuttings rooted when they were collected during the month of June but the results were not suitable because only about five per cent of the material used gave any indication of root stimulation. The following season the work was concentrated in the month of June with the following results.

Rooting Response of Magnolia grandiflora
Cuttings (50 cuttings per treatment)

Date Made	Date Rooted	Per Cent Rooted
June 2	July 19	84
June 9	July 26	82
June 16	August 1	88
June 23	August 9	86

Cuttings were taken in early morning before the full heat of the sun had reached the parent plants. These cuttings were put into bushel baskets on wet sphagnum moss and then covered with another layer of wet sphagnum while they were taken to the greenhouse for processing.

The cuttings were made approximately six inches long from terminal portions of the current season's growth, from the lower limbs of the trees. The stems were cut at an angle of forty-five degrees about one-quarter of an inch below a node. The lower one inch of the stem was slit on two sides with the tip of a sharp knife blade. Then the cuttings were treated with various root stimu-

lating chemicals. A twenty thousand parts per million dip, for ten seconds, of an indolebutyric acid and water solution gave the most satisfactory results. This solution was prepared by dissolving a gram of indolebutyric acid crystals in a very small amount of ninety per cent ethyl alcohol and then adding enough distilled water to bring the total volume to fifty cubic centimeters. After this treatment the fifty cuttings used were inserted in a sand filled greenhouse bench under a low pressure intermittent spray system to keep them moist. The water operated from one hour after sunrise until one hour after sunset for a period of fifteen seconds during every ten minute interval. The mist nozzles were of the baffle type.

Cuttings taken at weekly intervals in June were well rooted in forty-four to forty-seven days. The roots stimulated were three to six inches long and approximately four to eight roots were formed on each cutting. When the cuttings are rooted it is best to reduce the amount of water they receive in order to allow them to harden off naturally. This can be achieved over a two week period by halving the watering time every four days. A light shade is beneficial as the amount of water is reduced.

With this simple and inexpensive method the average gardener should be able to grow new plants from his favorite Southern Magnolia and it will be that the treatment will be of value in promoting root development on cuttings from other plants of a similar nature.—L. J. ENRIGHT, *University of Maryland, College Park, Maryland.*

Summer bloom from bulbs

In the garden at Haphazard, we depend on bulbs for most of our late summer and autumn bloom. We have tried to grow brunsvigias under all of the conditions available in this climate and unless the summer is dry enough for them to have a real rest, we get no blossoms, only splitting of the bulbs and growth.

Our first *Amarcrinum howardi* was purchased ten years ago, and given the same treatment that I give the hybrid amaryllis, part shade (under deciduous trees), plenty of humus added to the

soil, and heavy mulch during the winter and some mulch in summer. All of my amaryllis are fed about twice a year with a well balanced fertilizer. We have never failed to have blossoms during the month of August and we now have six bulbs in the clump. I am sure that if this bulb had been planted where it had more water than I have been giving it, it would bloom more freely and multiply faster.

Other fall blooming bulbs include a number of different kinds of lycoris, both pink and red rhodophiala, *Cyclamen neapolitanum*, and sternbergias.—Jo N. EVANS, *Haphazard Plantation, Ferriday, Louisiana.*

A First Planting of Brodiaeas

Because a corm of *Brodiaea lactea* that came accidentally to the garden has shown every sign of being at home, twenty-five corms of *B. lactea*, *laxa*, and *grandiflora* were purchased and planted in the autumn of 1957. All showed signs of sending up winter foliage which is the one thing that may determine the success or failure of any bulbous plant in this climate. If there is winter foliage, how much cold will it endure, how much damage will it show?

All three species planted showed no signs of damage to such foliage as appeared, and as warmer weather approached, showed very distinct tempos in making growth. *Lactea* moved first and most rapidly, *laxa* next, and *grandiflora* the most slowly.

Lactea has been in excellent bloom since about the middle of April and only the oldest flowers are beginning to show the transparent, everlasting-like appearance of age. The bloom is an off-white with some greenish venation. *Grandiflora* is opening its first blooms, of moderately deep purple lavender, but on rather short stipes, that are still growing and may in time reach the height of the 14 inch stipes of *lactea*. The foliage on *laxa* is luxuriant, and much broader than in any of the others, but no buds are in sight as yet (April 29).

If anyone in the South, perhaps better the "Deep South," has grown these or other species, may we have a note for the magazine?—B. Y. M., *Pass Christian, Mississippi*.

Thryallis glauca

The past winter of 1957-58, which will go down in history as one of the coldest in the local memory, had only the virtue of turning cold in late November and staying cold till mid-March. That sort of winter is an advantage over the typical winter in which periods of warmth occur irregularly throughout the months of January and February with damage to many plants, even the so-called iron clad.

Growing *Thryallis* here was a venture. The two nights when the temperature dropped to 20° F. took care of *Thryallis*, even if it had been protected by the shade of pine boughs stuck into the ground.

At this writing, April 29, the plant is putting up shoots from the crown, that

have every appearance of growing and thriving, so possibly the folly of planting it was not complete.—B. Y. M., *Pass Christian, Mississippi*.

Am inspired to write you . . . about my favorite shrub other than azaleas, *Thryallis glauca*. I have only one, which grew well, survived the winter of 56-57 and was over five feet tall. I regret to state that the main stem bit the dust last winter but an offshoot is still active. So, it is apparently hardy down to 22° F. but not at 18°.—MRS. RICHARD MURRELL, *Baton Rouge, Louisiana*.

Another member of the Society has a further note to add in regard to *Thryallis*, namely, that even in areas where it is entirely at home and does well, its wood is very brittle and whenever anything falls on it, there is a breakage that takes time for replacement. Otherwise, it is a most valuable summer-flowering shrub of considerable dimensions.—*West Palm Beach, Florida*.

Arum pictum, Oh, No!

This last season dime stores in many parts of the country offered "bulbs" of *Arum pictum*, in neatly packaged boxes, with a fine cut of a yellow flat spathed bloom dotted with almost scarlet. The note said that it could be flowered without the benefit of soil and so on. . . .

The plant we had is not *Arum pictum* (syn. *A. corsicum*), nor are any others that have been reported to the writer. Of course, *Arum pictum* is now referred to as *Sauromatum guttatum*, particularly variety *pedatum*, which is probably the plant we have. The reference in *Hortus II* gives the data that some of the forms of *S. guttatum* have been grown as *Arum cornutum* and "red calla." Probably "cornutum" is an error for "corsicum."

But no reference that has come to the writer's notice reminds the reader that the astonishing flower with its deep brown to purplish spathe, all very interesting in detail, and all that, gives off the odor of dead flesh, and attracts insects that like that sort of thing.

The leaf that follows the bloom is large, beautifully lobed, and gives a fine effect in contrast with other foliage plants that are more typical of temperate regions. It remains to be seen if the plant will be hardy here and whether or not the interest of the details of the color-

ing will compensate for the stench, for that is the proper word.

Sauromatum guttatum lived through last winter outdoors at Longwood Gardens, Kennett Square, Pennsylvania. It has lived through many winters at the Bailey Hortorium Garden at Ithaca, New York, but has never bloomed at the Ithaca garden.—B. Y. M., *Pass Christian, Mississippi*.



Echeveria affinis . . . from a leaf cutting.

Echeveria affinis
A new succulent from Sinaloa,
Mexico

An ornamental succulent collected in 1951 by H. S. Gentry and Charles L. Gilly at Palmita, Sinaloa, Mexico, was identified at the time as a species of

Graptopetalum and distributed under Plant Introduction Number 197,677. It has since been identified by Eric Walther as *Echeveria affinis*, which he had described as a new species in the *Cactus and Succulent Journal*, Vol. 30, No. 4, July-August 1958.

E. affinis has proved to be an excellent pot plant for the home or the conservatory in the Northern States and could doubtless be grown out-of-doors in southern California and parts of Arizona. The plant forms a compact rosette of thick, acute, fleshy oblanceolate leaves, which are reddish-bronze under good light conditions. The leaf coloring is distinctive, setting the plant apart from most other commonly cultivated succulents. Under greenhouse conditions in Montana, the rosettes have been four to five inches across and stand perhaps one-half to two-thirds as tall. During mid-winter the plants produce cymes of bright-scarlet flowers on scapes up to a foot tall. The flowers last well and are produced over a period of two to three weeks. There is a possibility that *E. affinis* may be a short-day plant. It is not very tolerant to a low-light intensity situation.

A report from the Department of Horticulture, University of Wisconsin, Madison, Wisconsin, indicates that *E. affinis* grown in the greenhouse at seventy to eighty degrees has been of easy culture, producing attractive, very interesting flowers and that it should be a worthwhile addition to the list of house plants. A similar report was received from Garfield Park, Chicago, Illinois.

E. affinis is readily propagated from leaf cuttings. Each leaf will generally produce two to three plantlets, which may take at least a year to mature into sizeable specimens. *E. affinis* should become popular with aficionados of cacti and succulents. Stock plants were grown at the Montana Agricultural Experiment Station and returned to the Plant Introduction Station, Glenn Dale, Maryland for propagation. Small plants will be distributed to the floricultural trade from Glenn Dale.—H. N. METCALF, *Montana Agricultural Experiment Station, Montana State College, Bozeman, Montana*; and JOHN L. CREECH, *U. S. Plant Introduction Garden, Glenn Dale, Maryland*.

Rosa mutabilis

For the past several years. I have noted an occasional article in *The National Horticultural Magazine* regarding *Rosa mutabilis*. I have grown this rose in Fresno, California, for some ten years. Here, it commences to bloom several weeks in advance of any other species or hybrid. It continues to flower steadily, continually and abundantly until well past Thanksgiving (in 1957, until after Christmas). It is at least semi-evergreen and in mild winters completely evergreen.

The ten year old plants, after having been moved several times, are now from eight to ten feet tall, about the same through. They are pruned only to shape them, have never required any fungicide or insecticide and accept general garden care with enthusiasm. As a garden shrub for a lazy garden I know of nothing so rewarding.

Unfortunately, when the word rose is used, people think of the flower form of a Hybrid Tea and a delicate single flower is a disappointment because unexpected. Every one who observes the habit of *Rosa mutabilis* throughout the year appreciates its fine qualities. I cannot persuade the local nurserymen, however, to propagate it.—MILO E. ROWELL, *Fresno, California*.

The Native Cross-Vine

There are so few showy flowered evergreen vines that are hardy north of the Ohio that it is hard to understand the neglect of our native Cross-Vine, *Bignonia capreolata*, especially as it has fewer faults than most other woody vines. It climbs by means of tendrils and so does not strangle trees as do the twining vines. Its growth is not rank enough to risk smothering tree or shrub. Its tendency is to go straight to where it is going and make its chief foliage growth there, hence it does not swathe and obscure tree trunks as do English ivy, Virginia Creeper, Ampelopsis, and some other vines. It is easily eradicated if one wishes to get rid of it—at least that is so here in central Kentucky. It may send up new growth for a couple of years after

being cut back, but the growth is not aggressive nor unduly persistent.

The Cross-Vine is native to southern Illinois and Ohio, and southward. It has been reported winter hardy as a climbing vine in a sheltered location in Massachusetts, but usually grows only as a ground cover as far north as that. It is questionable whether it will bloom at the northern margin of its range. It is not particular as to soil but wants good drainage and shade. Its preference is for the north side of walls or trees, and in such spots it may climb to a height of fifty feet. Wherever it touches the ground it tends to root at each node. As far as my experience goes it is best to start plants from these rooted sections. Sizable vines usually die back when transplanted even with the best of care, which may be one reason it is not more commonly grown.

The abundant flowers of the Cross-Vine vary from yellow to orange red and open here about the time the oaks begin to leaf out. The flowers are slightly smaller than those of the closely related Trumpet Creeper, *Campsis radicans*, but are similar in shape. They are most spectacular when the vine climbs the common red cedar and festoons it with bloom, though they are only less startling when draping a white blotched sycamore, and are lovely on any tree. The bloom is also effective on wall or fence. The vine may possibly bloom as a ground cover, but I have never known it to do so.

The foliage, which may be either yellow green or rich purplish on the under side, consists of a two parted leaf and a tendril. The leaves are definitely evergreen and not merely persistent, but they lack the substance and finish of English ivy and evonymus. Probably few people would plant it for its evergreen value alone. The showy early flowers, however, make it well worth growing.

My first experience with the Cross-Vine was when I brought it in from my cliffs twenty-seven years ago while trying to find a vine that would cling to new masonry. It grew well on a new north chimney and soon afforded support over which English ivy would climb. The two have shared the chimney ever since, the Cross-Vine showing merely as a fringe of growth above the wall of English ivy.—MAUD R. JACOBS, *South Carrollton, Kentucky*.

Firmiana simplex

This oriental tree that most of us oldsters knew as *Sterculia platanifolia* is perhaps not met as often as it should be. It has several distinctions.

The writer first saw it in some new plantings in Wuchang, China, and not knowing it, asked. The name was given correctly but it was suggested that it was not a very choice tree, but one that was planted there and in all of southern China when one wanted a tree in a hurry. It was next seen as old trees in Washington, D. C., one on the grounds of the Library of Congress and one in an area now improved out of existence, a portion of the so-called Botanic Garden, an area that was rich in plant materials assembled by William R. Smith while he was director. (Then one could see a superb tree of *Parrotia*, a fine *Cunninghamia*, some prostrate specimens of *Cephalotaxus*, and even a tree of *Hovenia dulcis*.) These last trees had suffered at times from climatic lows, and had been pruned back severely, something that altered their appearance in winter but not in summer.

Here in Pass Christian there are a few specimens, none particularly cherished. Several have been cut to the ground and are now represented by vigorous shoots from the base. In one old area where the mother tree has not yet been seen there are many seedlings of various ages.

There are two very outstanding characters that are noted: first, on the bark which is absolutely smooth, a dull matt quality of gray green that is rarely seen, and with a surface that in the trees known to the writer does not show the growth scars that are seen, for example, on beech. The second is the size of the leaf. As in the case of catalpa and *Paulownia*, leaves on vigorous young shoots are often larger than normal, but the leaf on the mature tree is often a foot across, with palmate lobes three to five in number. When a good specimen is growing in company with trees of moderate sized leaves the effect is much more striking than that given even by sycamores.

The large panicles of bloom will not attract much attention, but the seed pods, are large and as they mature separate into four lobes with the seeds on the inner edges. The pods are fairly persistent but here, do not hang on after

the leaves have fallen. The area under the tree is usually well furnished with seedlings that appear in great numbers, but seem to perish in large percentage.

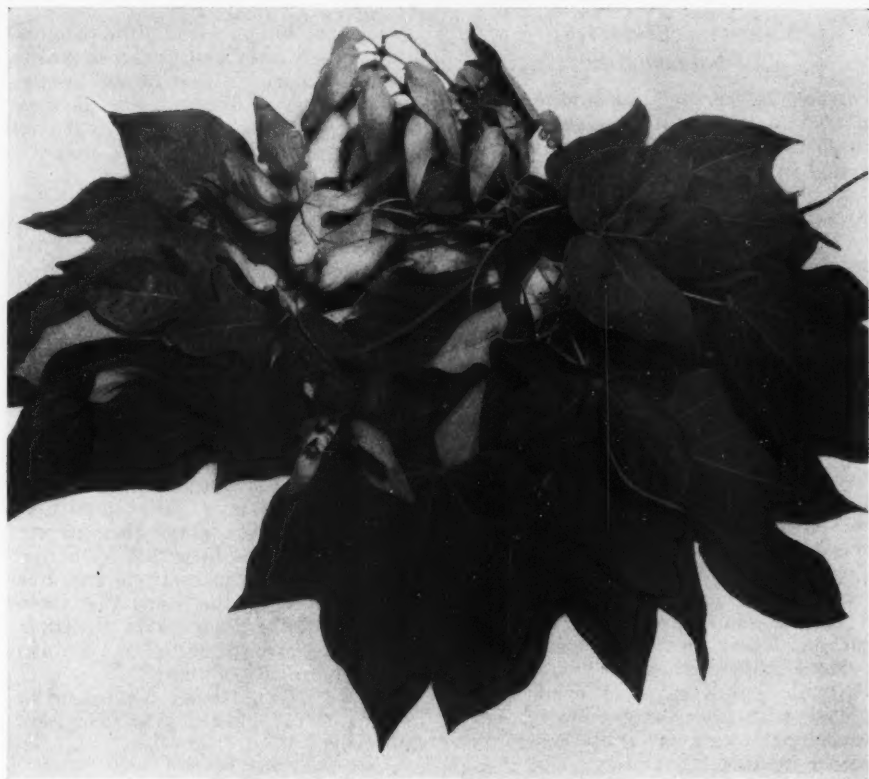
The only other tree that comes to mind with fruiting characters in such striking fashion is *Cedrela sinensis* which has equally striking inflorescences, showier in fact in that the flowers have petals and are white, and in that the seed pods are starry in effect. This tree as known to the writer in Washington, D. C., had the poor characteristic of yielding shoots from the root system, whether injured or not. It had a rather striking bark character, something like that of the hickory, and long compound leaves like those of *ailanthus*, so that its contribution to "tropical" effects was real but very different from that of the *Firmiana*.

The writer does not know, but wonders if this tree, *Firmiana*, may not be the tree with large leaves that appears so often in ink paintings, chiefly from China. The Japanese name for it, *Aogiri*, is related to that of *Paulownia* which is *kiri*, and they are mentioned in Conder's old books, in succession among important deciduous trees and shrubs. "K" in Japanese when romanized turns into "G" in compounding, so the relations may be only a visual one.

The species is not mentioned in Bruce Wigginton's excellent *Trees and Shrubs for the Coastal Southern Plain*. Dr. Hume does not mention it in the earlier edition of *Gardening in the Lower South* and it has no place in the delightful *Flowers of the South, Native and Exotic*, by Greene and Blomquist. What is the scandal? Or is this a plant that does not move well and so is abandoned by nurserymen who prefer to grow sure fire stuff?

An inquiry of Mr. Wigginton as to what he thought of *Firmiana simplex*, which he did not include in the book, brought the comment:

"I am fairly familiar with the *Sterculia* which is fairly common in the Athens—Atlanta area. I omitted it from the Coastal Plain Book because I really do not think it has anything to recommend it for general use. As I have seen it, I have always felt that its form was ungainly, the flowers disappointing, and the foliage although rather handsome in detail, coarse in effect. The *Paulownia*, although a little larger, I always felt



Firmiana simplex—leaves and seed pods
(some opened exposing the seeds attached to the inner edges)

superior to this in the same general foliage and habit category. I am sure there would be plenty to disagree, however! It grows well in Athens, no trouble."

Mr. Edward Horder, Fairhope, Alabama, writes:

"There are a number of these trees in the Mobile area, and they grow very well in this climate. One specimen in Fairhope, stands about thirty feet tall, with a ten inch trunk diameter but it can be expected to get a little taller with age, to forty or fifty feet. Numerous seedlings volunteer about the base of the tree, in all sizes, where they manage to survive in tough competition with the natives.

"The tree has green bark and very large, sycamore-like leaves. The fruits are the structures that really make the tree unusual. These are at first closed and then they open into four leaf-like sections, each one with two to three un-

ripened seeds attached to the margins. The seeds look like English peas. The fruits are conspicuous on the tree all summer.

"Apparently the tree does not require any special conditions here, in order to grow very well.

"In addition to its botanical name, *Firmiana simplex*, the tree is known in the South, as Phoenix tree, Chinese Parasol tree, and Japanese Varnish tree, enough names to worry any one."

Another member writes from New Orleans: "I am quite familiar with *Firmiana simplex*. It is a pest. I like the shape of the trees and their smooth bark but, oh, those seedlings! There are two large specimens over our back fence and I spend my days pulling up their offspring. Best thing I can say is that even the two-year-olds come up easily after a rain. After that, it takes a spade for the long tap root."—B. Y. M., *Pass Christian, Mississippi*.

A Note on Early History of Saintpaulia

About a year ago the addition of a partial file of the famous old English magazine *The Garden* to my library resulted in my turning up a short article and plate that may be of some interest to African Violet addicts.

The genus *Saintpaulia* was introduced into cultivation in 1892, soon after its discovery in Africa. The earliest colored plate of *S. ionantha* was published in 1892 in *Gartenflora* (Berlin), Vol. 42, Plate No. 1391, in connection with the article establishing the genus *Saintpaulia* and the species *S. ionantha*.

In *The Garden* for 1895, Vol. 47, facing page 132, is their plate No. 1002. (Issue of 2/23/95). This is, as nearly as I can establish, the second color plate of the African Violet ever published, and the first published in a magazine in English. *The Garden* was a weekly publication, and each week's issue included a colored plate about nine by twelve inches. These are fine examples of colored lithographs, taken from especially made paintings. The example depicted, with fifteen open flowers, seems to compare very favorably with some recent hybrids I have seen.

It might be of some interest to quote the short article on page 133 which accompanied the plate. It must be remembered that at the time the plant was very new and very rare. And, in England, in 1895 a 'warm greenhouse' was within the means of only the well-to-do.

"Few plants introduced of recent years seem likely to become more popular than the *Saintpaulia* which is shown in the accompanying plate. We remember that it was well shown at the last Ghent exhibition, where it was exhibited by Messrs. Linden of Brussels. As will be seen from our illustrations, the *Saintpaulia*, which represents a new genus, is much like the *Ramondia* in general aspect, and came to us from the Usambara Mountains, in Central Africa, being discovered by St. Paul-Illaire, the governor of Usambara, hence the generic name. The plant makes quite a tufted growth, with firm-textured leaves, hairy and of oblong form, whilst the rich violet-purple flowers are about three inches across. The plant when well

grown is in bloom for months together, and is raised from seed, which should be treated similarly to that of the *Streptocarpus*. It is very fine and must be sown carefully. A warm greenhouse will grow the *Saintpaulia* well. Another way of propagating it is by division of the leaves, only a bulb is not formed, but fibrous roots."

Note the "three inch flowers." And did the writer think that seedlings formed bulbs or tubers?

In the issue of March 16th is a note signed by Baron von Saint-Paul of Fischbach, Silesia.

"Allow me to correct a slight error on page 133 of *The Garden* about *Saintpaulia ionantha*. This lovely plant, which has been discovered and introduced into Europe by my son, never has flowers of three inches diameter, the colored plate showing the flowers about their natural size. It grows best in a rich open compost in shady warm quarters and likes much moisture at the roots. The young offsets which the plant makes plentifully at the collar give the best plants if potted separately in proper time."

Oh, well, even Homer nodded on occasion.—L. T. PEERY, M.D., Hayward, California.

Crinum, Ellen Bosanquet

Crinums have been avoided in this garden for two reasons: the bulbs are huge and take more room than is often wanted to be spared, and the foliage which is fine enough, makes a sorry mess when frosted! Thanks to several friends, this lack of *crinums* has been interrupted. The subject of the present note, *Crinum* Ellen Bosanquet, which is not a novelty at all, is a charming thing with nicely formed flowers of a very delightful rose color that has an undertone of yellow to make it lively. It remains to be seen how it will look when frost touches the foliage mass, but as of now it is well worth the space. The foliage mass makes a wonderful contrast with that of the azaleas among which it is placed. This bulb came to us from W. O. Freeland, of Columbia, S. E., another A.H.S. member.—B. Y. M., *Pass Christian, Mississippi*.

AMERICAN HORTICULTURAL SOCIETY

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San Francisco Garden Club

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Takoma Horticultural Club (Maryland-D. C.)

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Allium albopilosum

